SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

LEVEL

1. REPORT NUMBER

2. GOVT ACCESSION NO.

3. RECIPIENT'S CATALOG NUMBER

4. TITLE (and Subtitle)
Phase I Inspection Report
Mill Street Dam
Oswego River Basin, Cayuga County, New York
Inventory No. NY 775

5. TYPE OF REPORT & PERIOD COVERED
Phase I Inspection Report
National Dam Safety Program

6. PERFORMING ORG. REPORT NUMBER

7. AUTHOR(s)
George Koch, P.E.

8. CONTRACT OR GRANT NUMBER(s)
DACW-51-79-C-0001

9. PERFORMING ORGANIZATION NAME AND ADDRESS
New York State Department of Environmental Conservation/ 50 Wolf Road
Albany, New York 12233

10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS

11. CONTROLLING OFFICE NAME AND ADDRESS
New York State Department of Environmental Conservation/ 50 Wolf Road
Albany, New York 12233

12. REPORT DATE
28 Sep[redacted]79

13. NUMBER OF PAGES

14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)
Department of the Army
26 Federal Plaza/ New York District, CofE
New York, New York 10007

15. SECURITY CLASS. (of this report)
UNCLASSIFIED

15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)
Approved for public release; Distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)
Dam Safety
National Dam Safety Program
Visual Inspection
Hydrology, Structural Stability
Mill Street Dam
Cayuga County

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization.
Mill Street Dam did not reveal any conditions which pose an immediate threat to life or property. However, an undermining of the downstream apron should be corrected. Additionally, problems such as surface runoff gullies, riprap failure, concrete deterioration, and some debris accumualtion should be remedied.

DDC
RECEIVED
NOV 1 1979
A

DDC FILE COPY

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

UNCLASSIFIED 393 970
SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

Best
Available
Copy

DISCLAIMER NOTICE

THIS DOCUMENT IS BEST QUALITY PRACTICABLE. THE COPY FURNISHED TO DDC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.

OSWEGO RIVER BASIN

MILL STREET DAM

CAYUGA COUNTY, NEW YORK
INVENTORY No. NY 775

PHASE 1 INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

CONTRACT NO. DACW-51-79-C0001

NEW YORK DISTRICT CORPS OF ENGINEERS

SEPTEMBER 1979

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
MILL STREET DAM
I.D. No. NY-775
OSWEGO RIVER BASIN
CAYUGA COUNTY, NEW YORK

TABLE OF CONTENTS

PHASE I REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Mill Street Dam I.D. No. N.Y. 775
State Located:	New York
County:	Cayuga
Watershed:	Oswego River Basin
Stream:	Owasco Lake Outlet
Date of Inspection:	August 2, 1979

ASSESSMENT

Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property.

Several deficiencies were noted and these should be corrected within 1 year of the date of final approval of this report. The most serious of these deficiencies was the undermining of the downstream apron. Other problems noted were gullies caused by surface runoff, a section of riprap which had failed on the western bank, deterioration of concrete on the walls of the power canal, and an accumulation of debris on the trash racks in the power canal.

This dam does not have sufficient spillway capacity to adequately discharge the peak outflow from one-half the PMF with the automatic gates open. However, the structural stability analysis indicates that the dam would not be unstable when subjected to the PMF storm event. Prior studies have determined that serious damage can occur along Owasco Outlet when downstream discharges exceed 1,500 cfs. Therefore, the spillway is assessed as being inadequate.

George Koch

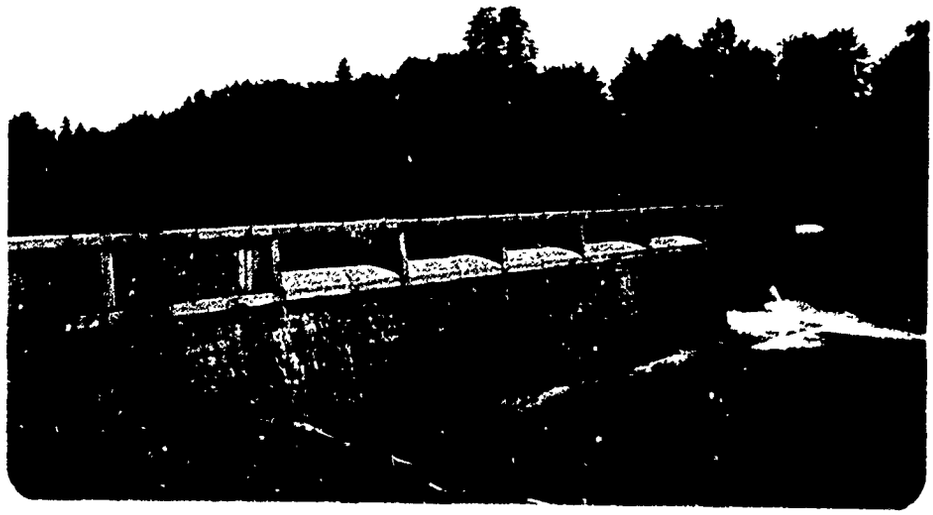
George Koch, Chief
Dam Safety Section
New York State Department of
Environmental Conservation
NY License No. 45937

Approved By:

Col. Clark H. Benn
New York District Engineer

Date: 28 Sept 79

Overview - Mill Street Dam I.D. No. N.Y. 775 - Upstream Face



Overview - Downstream Face

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
MILL STREET DAM
I.D. NO. N.Y. 775
#64B-4198
OSWEGO RIVER BASIN
CAYUGA COUNTY, NEW YORK

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase 1 inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367.

b. Purpose of Inspection

This inspection was conducted to evaluate the existing conditions of the dam, to identify deficiencies and hazardous conditions, to determine if these deficiencies constitute hazards to life and property, and to recommend remedial measures where required.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam and Appurtenant Structures

The Mill Street Dam is a masonry and concrete structure with a gated principal spillway and a crest designed to act as an auxiliary spillway. A foot bridge crosses the top of the dam above the auxiliary spillway crest.

The eastern end of the dam is masonry with a layer of concrete on the upstream face. This segment of the dam is 160 feet long and 25 feet high. The western end of the dam is reinforced concrete with a stone facing on the downstream fascia. This segment of the dam is 76 feet long and 25 feet high.

The principal spillway is located between these two segments. It consists of two trapezoidal channels with automatic flow control gates to regulate outflows. A sluice gate with a square opening 5 feet by 5 feet is located at the base of this section of the structure. This gate can be opened to drawdown the reservoir pool.

A concrete weir on top of a portion of both the masonry and concrete sections forms the auxiliary spillway crest. The auxiliary spillway is divided into 6 sections (5 to the east of the principal spillway section and 1 to the west) by the piers for the foot bridge.

A "Power Canal" on the eastern end of the dam also acts as a spillway at the dam site. Flow in the canal is controlled by a weir located near the downstream end of a 310' channel. The crest elevation of this weir is such that at normal pool elevation there will be flow in the canal, even if the automatic gates

close completely. A highway bridge crosses the canal near the inlet. Downstream of the weir is the inlet to an oval (10 ft. x 12 ft.) penstock which carries water to the non-operational powerhouse. The penstock is about 1500 feet long.

b. Location

The Mill Street Dam is located on Owasco Lake Outlet in the City of Auburn. It is approximately one mile downstream of the Owasco Lake Outlet Dam and about ½ mile upstream of U.S. Route 20. The eastern end of the dam is located adjacent to Miller Street which is off N.Y. Route 38A.

c. Size Classification

This dam is 25 feet high and the reservoir has a storage capacity of 255 acre-feet. Therefore, the dam is in the small size category as defined by the Recommended Guidelines for Safety Inspection of Dams.

d. Hazard Classification

The dam is classified as "high" hazard due to the presence of a large number of homes and commercial establishments in the City of Auburn located downstream of the dam.

e. Ownership

The dam is owned by the City of Auburn. The City Engineer is Mr. Michael O'Neil. Mr. O'Neil's address is 24 South Street, Auburn, New York 13021 and his phone number is 315-252-9531.

f. Purpose of Dam

The dam was originally used to provide a pool to power a mill wheel. In about 1926, the mill wheel was replaced by a hydraulic turbine to generate electricity. The station was operated up until the dam partially failed in 1972. The dam was reconstructed in 1976 to restore the pool for aesthetic and recreational purposes.

g. Design and Construction History

The original dam was built in about 1875. No information concerning the original design or construction was available. The structure partially failed during the flood caused by tropical storm Agnes in June 1972. The dam was reconstructed in 1976. The design for this reconstruction was performed by Konski Engineers of Syracuse, New York.

h. Normal Operating Procedures

The water level in the pool is kept approximately constant for a wide range of flows by the automatic gates (2). If these gates close completely, additional discharge is possible through the operation of the sluice gate.

1.3 PERTINENT DATA

a. Drainage Area — 208 square miles

b. Discharge at Dam

STAGE	WATER SURFACE ELEVATION @:	DISCHARGE: RESERVOIR DRAIN (FULLY) (OPEN)	(2) AUTOMATIC GATES (BOTH) (OPEN)	(2) AUTOMATIC GATES SIDEWALL OVERFLOW	AUXILIARY SPILLWAY	POWER CANAL WEIR	TOTAL (CFS)
689.94	Sill of Automatic Gates	403	---				403
695.92	Crest of Power Canal Weir	533	872			---	1405
696.5	Normal Water Surface	544	940			33	1517
696.6	Crest of Auxiliary Spillway	547	948		---	42	1537
697.29	Top of Automatic Gates Structure	560	1002	---	230	119	1911
702	Top-of-Dam	641	1372	872	5964	1115	9964

c. Elevation

Top-of-Dam	702.0
Auxiliary Spillway Crest	696.6
Normal Water Surface	696.5
Power Canal Weir Crest	695.92
Automatic Gates - Sill	689.94
Sluice Gate - Invert	678.5

d. Reservoir Surface Area

	(Acres)
Top-of-Dam	24
Auxiliary Spillway Crest	17

e. Storage Capacity

	(Acre-Feet)
Top-of-Dam	255
Auxiliary Spillway Crest	137

f. Dam

Masonry and Reinforced Concrete Dam

Dam Length (feet)	277
Crest Elevation	702.0
Crest Width (feet)	12

g. Spillway

Principal Spillway

Type: Two trapezoidal channels with automatic flow control "Amil" gates manufactured by Alsthom Atlantic, Inc.

Auxiliary Spillway

Type: Concrete ogee-shaped weir above masonry and concrete sections. Divided into 6 sections by piers of the foot bridge. Each section 19.5 ft. wide and 4.. feet high.

h. Reservoir Drain

Rodney Hunt sluice gate 5 ft. by 5 ft. located at the base of principal spillway section.

i. Appurtenant Structures

Power Canal - 24 ft. wide by 370 feet long canal with a concrete weir at downstream end. Downstream of weir is 10 ft. x 12 ft. inlet to penstock for powerhouse.

SECTION 2: ENGINEERING DATA

2.1 GEOTECHNICAL DATA

a. Geology

The Mill Street Dam is located near the border between the glaciated Alleghany Plateau physiographic province and the Erie-Ontario plains province of New York State. This portion of the Alleghany Plateau is cut by the Finger Lake troughs which are glacially modified valleys of preglacial rivers. The bedrock in the area is predominately limestone overlain by shale, siltstone, and sandstone. These rock forms are from the Devonian period of the Paleozoic Era. The surficial soils are the result of glaciations during the Cenozoic Era, the last of which was the Wisconsin glaciation.

b. Subsurface Investigations

No subsurface information was available concerning the foundation of the original dam. A series of six borings were progressed in 1975 as part of the design of the reconstruction of the dam. These borings indicated that the dam is founded on rock. The rock was soft and highly weathered shale with layers and seams of harder limestone which was more resistant to weathering.

2.2 DESIGN RECORDS

No records were available from the original design of the structure. A design report, prepared by Konski Engineers in 1975, for the reconstruction of the dam was available. This report contained hydrologic computations and preliminary structural stability calculations. A complete set of plans for this reconstruction was also available.

2.3 CONSTRUCTION RECORDS

The only construction records available were from the 1976 reconstruction. A complete set of as built plans, prepared by Konski Engineers, and the specifications for the reconstruction were available.

2.4 OPERATION RECORDS

There were no operating or water level records available for this structure.

2.5 EVALUATION OF DATA

Data concerning the design and construction of the original dam was very limited. However, the entire dam was affected by the reconstruction in 1976. Information regarding this reconstruction was available from the Department of Environmental Conservation files. The information which was available appears to be adequate and reliable for the purpose of the Phase 1 inspection.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of the Mill Street Dam was conducted on August 2, 1979. The inspection was conducted shortly after the conclusion of a thunderstorm with the temperature around eighty degrees. The water surface at the time of the inspection was several inches below the crest of the auxiliary spillway. The automatic gates of the principal spillway were partially opened and discharging satisfactorily.

b. Masonry and Concrete Sections

The main sections of the dam were in satisfactory condition. There were no signs of distress or movement. The masonry was in good condition with all joints properly pointed. The foot bridge which crosses the dam was also in good condition.

There were two deficiencies noted on these sections. Undermining of the apron beyond the downstream toe was discovered. The undermining was worst on the western end of the apron where a void extended more than 6 feet from the western edge. Near the principal spillway section, the void extended approximately 2 feet under the apron. The problem appeared to be under the apron only. There was no other evidence that the dam had been undermined, because the only location where undermining was noticeable was at the western end of the apron.

The other deficiency was of a minor nature. Surface runoff had created a small erosion gully along the upstream edge of the dam at the western abutment. This gully was about 2 inches deep and extended several inches along the slab.

c. Spillways

Both the principal spillway and the auxiliary spillway sections appeared to be in satisfactory condition.

d. Reservoir Drain

The sluice gate at the base of the principal spillway could not be inspected closely, because of flow from beneath the gate. It was not possible to determine whether the gate was partially opened or if the flow was because of a poor seal.

The gate control mechanism, which was located on the foot bridge, appeared to be operational and in good condition.

e. Downstream Channel

The channel below the dam was in satisfactory condition. There were several areas where the side slopes had been eroded. On the western end of the dam, the riprap had failed in an area which extended from the toe of the dam downstream about 10-15 feet. The failure appeared to have been caused both by scour and surface runoff. On the eastern end of the dam, erosion gullies had formed on the upper portion of the channel bank above the riprap. These gullies were caused by surface runoff occurring over a non-vegetated slope.

f. Reservoir

There were no signs of soil instability in the reservoir area. The slopes in the area immediately upstream of the dam had been armored with riprap to reduce the potential for scour.

g. Appurtenant Structures - Power Canal

The Power Canal near the eastern end of the structure was in satisfactory condition. The concrete on the top of the canal side walls was somewhat deteriorated and spalling. The weir at the downstream end of the canal and the trash rack at the inlet to the penstock were in good condition, but there was an accumulation of debris at each.

3.2 EVALUATION OF OBSERVATIONS

Visual observations revealed several deficiencies. The following items were noted:

1. The undermining of the downstream apron;
2. An erosion gully along the upstream edge of the dam at the western abutment;
3. The failure of the riprap on the western bank downstream of the dam;
4. The erosion gullies on the eastern bank downstream of the dam;
5. The deterioration of the concrete on the walls of the power canal;
6. The accumulation of debris in the power canal both at the weir and at the penstock's trash rack.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The water level in the pool is kept approximately constant for a wide range of flows by the automatic gates. Even when these gates close completely, flow through the power canal will continue until the water level drops below the elevation of the weir crest. Further discharge at lower reservoir levels can be achieved by the operation of the sluice gate.

4.2 MAINTENANCE OF DAM

The dam is maintained by the City of Auburn. While the dam itself is in satisfactory condition, increased maintenance is required to prevent the formation of erosion gullies and to deal with the scour problems (both under the apron and at the toe of the riprap on the western slope). In addition, the trash rack at the inlet to the penstock at the end of the power canal should be cleaned regularly to prevent the accumulation of debris.

4.3 WARNING SYSTEM IN EFFECT

No apparent warning system is present.

4.4 EVALUATION

A comprehensive maintenance program for the dam is required. This program should include redirection of surface runoff to prevent the formation of erosion gullies on the channel slopes and regular removal of debris from the power canal. An emergency warning system should also be developed.

SECTION 5: HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

The delineation of the contributing watershed to this dam is shown on the map titled "Drainage Area - Mill Street Dam" (Appendix C). The irregular-shaped, north-south oriented watershed of some 208 square miles is about 33 miles long and has a maximum width of 10 miles. The watershed exhibits relatively steep topography with elevations rising from 695 at the dam to the ridges at elevations near 1600. The major tributary within the watershed is named Owasco Inlet which empties into Owasco Lake. The 11 mile long lake has a surface area of 10 square miles and has a watershed of some 205 square miles.

From Owasco Lake northerly to this dam flows a portion of the 21 mile long Owasco Outlet which passes through the City of Auburn and terminates at the Seneca River. An additional 3 square miles of the entire watershed's 208 square miles is drained by this 2.7 mile reach of the outlet. Located 0.9 miles upstream from Mill Street Dam is the Owasco Lake Outlet Dam, a regulating structure which significantly affects flows at this site.

5.2 ANALYSIS CRITERIA

Existing hydrologic/hydraulic information (Ref. 1a,1c) concerning the Owasco Lake Watershed was used to obtain elevation-storage capacity data, elevation-surface area data, and watershed characteristics.

The analysis of the spillway capacity of this dam was performed using the Corps of Engineers HEC-1 computer program, Dam Safety version. A standard project flood (SPF) hydrograph (Ref. 1d) developed for Owasco Lake was input directly into the program, which then flood routed this hydrograph using the "Modified Puls" method over the Owasco Lake Outlet Dam spillway (both no breach and breached conditions) and over this spillway. The spillway design flood selected for analysis was the Probable Maximum Flood (PMF) in accordance with the recommended guidelines of the U.S. Army Corps of Engineers. The PMF storm event is approximately twice the size of the SPF storm event.

5.3 SPILLWAY CAPACITY

The concrete and masonry spillway structure consists of a twin-gated principal spillway and a multiple section ogee-shaped auxiliary spillway topped by a continuous 12 foot wide foot bridge. The two gates of the principal spillway are constant-level upstream control "Amil" gates manufactured by Alsthom-Atlantic, Inc. and were analyzed for orifice flow conditions with a maximum opening area of 75.4 square feet.

The six section ungated auxiliary spillway has a 45° sloping upstream face on an ogee-shaped crest and was analyzed for weir flow conditions.

Additional discharge capacity at the site is obtained from a "power canal" located just east of the dam. This 24 foot wide canal has an ungated weir for flow control and directs discharges into an oval penstock (10 x 12 feet) leading to a non-operational powerhouse. A 5 x 5 foot Rodney Hunt sluice gate acts as a reservoir drain, but was not considered operational during the PMF storm event.

The following table indicates the conditions analyzed:

ANALYSIS CONDITIONS (SPF HYDROGRAPH FOR) (OWASCO LAKE)	ONE-HALF PMF			PMF		
	Peak Inflow	Peak Outflow	Depth Above 702.0*	Peak Inflow	Peak Outflow	Depth Above 702.0*
1) OWLO - no breach; all gates fully open MSD - no breach; 2 gates open	70684	10354	0.38	141368	25773	3.98
2) OWLO - same as 1) MSD - no breach; 2 gates closed	70684	10354	0.81	141368	25773	4.30
3) OWLO - breached @ W.S. Elev. 724 MSD - no breach; 2 gates closed	70684	10354	0.81	141368	30543	5.20
4) OWLO - same as 3) MSD - same as 1)	70684	10354	0.38	141368	30543	4.89

DISCHARGE CAPACITY @ Mill Street Dam (MSD)

Conditions 1) and 4) 9323 cfs
2) and 3) 7951 cfs

NOTE: 1)* Top-of-Dam is the Foot Bridge:

Upstream edge of slab @ Elev. 702.00
Crowned top of slab @ Elev. 702.06

2) OWLO = Owasco Lake Outlet Dam

The spillway does not have sufficient capacity for discharging the peak outflow from one-half the PMF. For this storm event, the peak inflow is 70,684 cfs and the resulting peak outflow is 10,354 cfs. The computed spillway capacity with the "Amil" gates open is 9,323 cfs.

5.4 RESERVOIR CAPACITY

The reservoir impounded by this dam lies primarily within the limits of the existing channel of Owasco Outlet downstream of the Owasco Lake Outlet Dam. The normal water surface is at or near the auxiliary spillway crest elevation of 696.6. The impounded storage capacity for this elevation is 137 acre-feet. Surcharge storage capacity to the top-of-dam elevation if 702.0 adds 118 acre-feet for a total impounded capacity of 255 acre-feet.

5.5 FLOODS OF RECORD

The maximum known flood in the watershed occurred on June 23, 1972 during tropical storm Agnes when the USGS gaging station, located 3.1 miles downstream, recorded a maximum discharge of 3,250 cfs. However, this structure partially failed during this storm resulting in the need for structural repairs. Hence, the existing "new" dam has not been subjected to a major flood event since its completed 1976 reconstruction.

5.6 OVERTOPPING POTENTIAL

Analysis indicates the spillway does not have sufficient discharge capacity for one-half the PMF. The computed depth of overtopping is 0.38 feet for this storm event. Overtopping would occur for all storm events exceeding 46% of the PMF, under flow conditions having both automatic gates in the open position.

5.7 EVALUATION

This dam does not have sufficient spillway capacity to adequately discharge the peak outflow from one-half the PMF with the automatic gates open. However, the structural stability analysis indicates that the dam would not be unstable when subjected to the PMF storm event. Prior studies (Ref. 1a) have determined that serious damage can occur along Owasco Outlet when downstream discharges exceed 1,500 cfs. Therefore, the spillway is assessed as being inadequate.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

Visual observation of the dam did not reveal any signs of major distress. Both the horizontal and vertical alignments were normal. The masonry appeared to be in good condition.with no seepage between blocks and all joints properly filled. The exposed concrete showed no signs of deterioration.

b. Data Review and Stability Evaluation

The structural and subsurface information used for the preparation of this report were obtained from the design report and construction plans prepared by Konski Engineers. Cross sections of the dam shown on these plans were used to perform a structural stability analysis. The following conditions were analyzed:

a. Normal conditions with reservoir at auxiliary spillway crest;

b. Reservoir at auxiliary spillway crest with an ice load of 7,500 lb./ft.;

c. One-half PMF, water flowing over the auxiliary spillway crest at a depth of 5.46 feet;

d. PMF, water flowing over auxiliary spillway crest at a depth of 9.14 feet.

The analyses performed (See Appendix D) indicate that the factors of safety against overturning and sliding are as follows:

CASE	FACTORS OF SAFETY OVERTURNING	SLIDING
a) Reservoir at auxiliary spillway crest;	1.81	22.71
b) Reservoir at auxiliary spillway crest, ice load 7,500 lb./ft.;	1.28	17.04
c) ½ PMF, water flowing over auxiliary spillway to depth of 5.46 feet;	1.46	16.39
d) PMF, water flowing over auxiliary spillway to depth 9.14 feet.	1.29	13.79

The analyses indicate that the factors of safety against sliding under all loading conditions are acceptable. The safety factor against overturning under normal conditions is acceptable, but under extreme loading conditions (ice load, PMF) factors are somewhat lower than desirable. However, in all cases analyzed the resultant falls within the middle two thirds of the base. In addition, the effects of the rock anchors would serve to increase the factors of safety against overturning for all conditions.

d. Seismic Stability

This dam is located in Seismic Zone 2. Due to the location, a seismic stability analysis was performed in accordance with Corps of Engineers' guidelines. The seismic analysis was performed for normal conditions with the water level at the auxiliary spillway crest. The safety factor against overturning with seismic considerations included is 1.65 and against sliding is 1.71. Therefore, the dam appears to have adequate factors of safety for earthquake loading conditions.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety
The Phase 1 inspection of the Mill Street Dam did not reveal conditions which constitute a hazard to human life or property. The deficiencies noted can be corrected through increased maintenance efforts.

b. Adequacy of Information
The information available for the preparation of this report was adequate.

c. Need for Additional Investigations
No additional investigations are required at this time.

d. Urgency
The deficiencies noted on this structure should be corrected within 1 year of the date of approval of this report.

7.2 RECOMMENDED MEASURES

a. The undermining of the downstream apron should be repaired.

b. The erosion gully along the upstream edge of the dam at the western abutment should be regraded.

c. The riprap failure which starts at the downstream toe of the dam on the western bank should be repaired.

d. The eastern bank downstream of the dam should be regraded and seeded to establish a good vegetative cover on the slope.

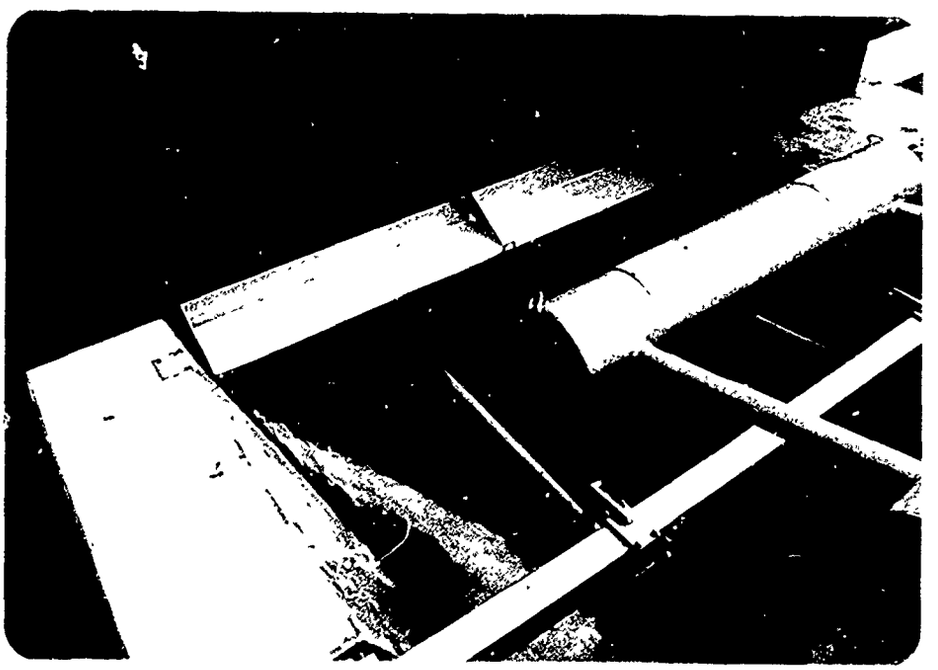
e. The concrete on the walls of the power canal are deteriorating and need to be repaired.

f. The debris which accumulates in the power canal both at the weir and at the penstock's trash rack should be removed.

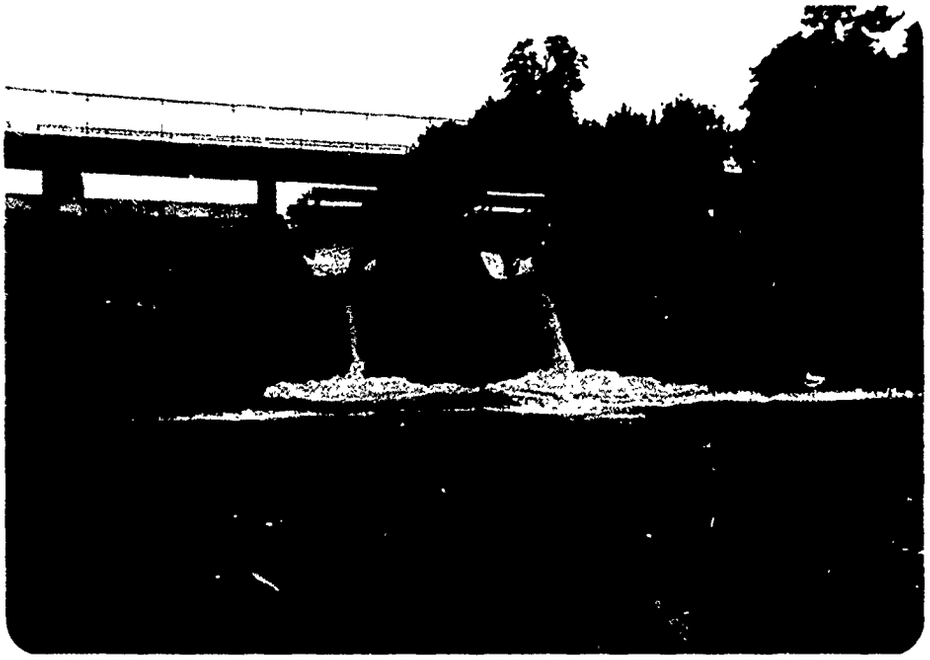
APPENDIX A

PHOTOGRAPHS

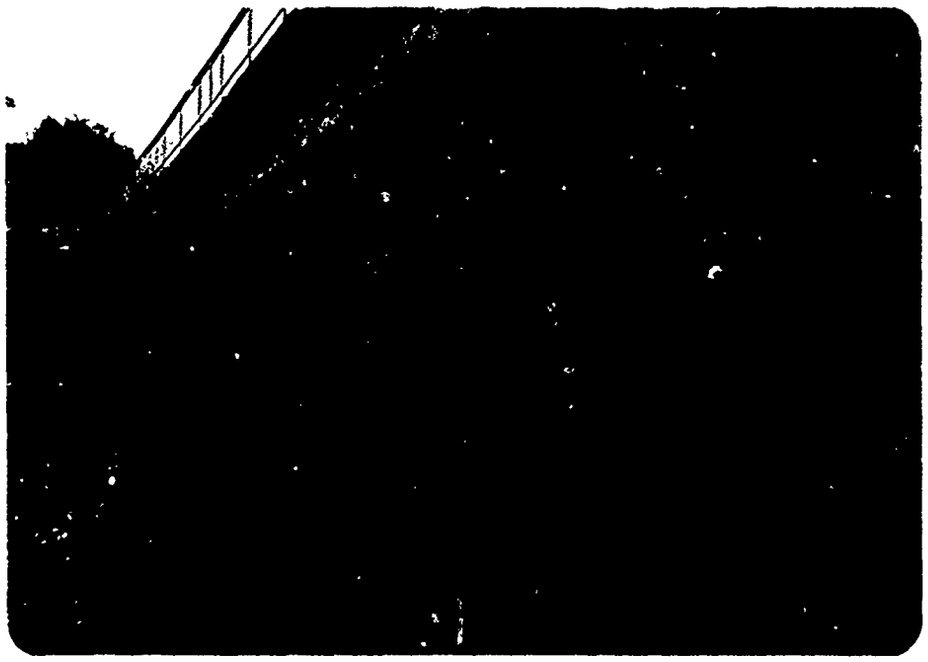
Principal Spillway - Automatic Flow Control Gate



Automatic Flow Control Gate Partially Opened



Principal Spillway Channels with Reservoir Drain Outlet in Center



Downstream Face of Dam - Note Good Condition of Masonry and Joints

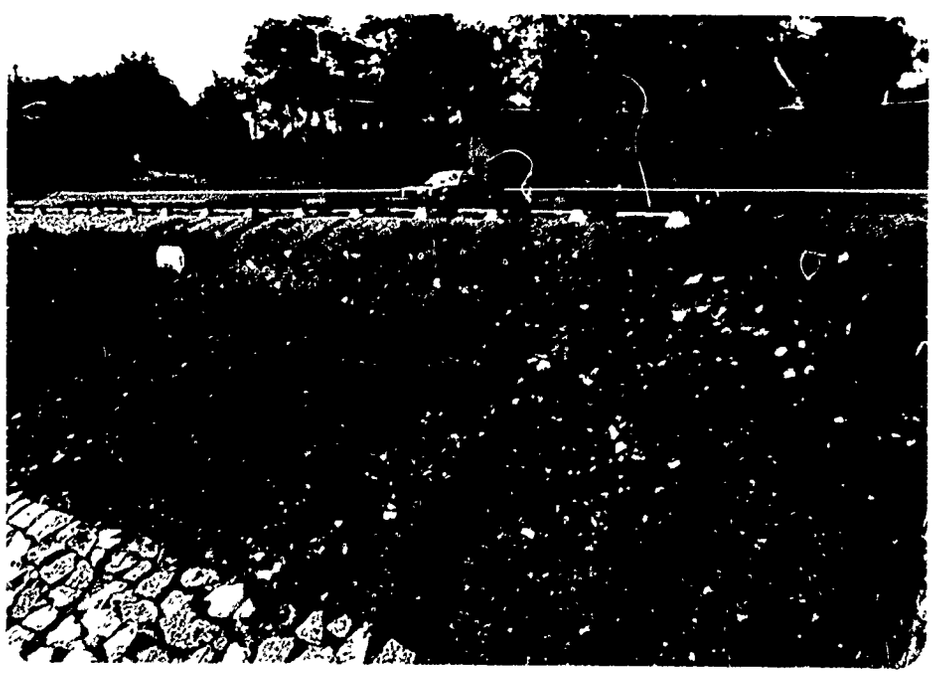
Void Under Downstream Apron at Western End of Dam

Undermining of Downstream Apron at Western End of Dam

Riprap Failure - Western Abutment

Riprap Failure - Western Side of Channel Downstream of Apron

Erosion Gully Along Upstream Edge of Dam at Western Abutment



Erosion Gullies on Eastern Bank Downstream of the Dam

Weir on Power Canal - Note Debris Accumulation

Downstream Channel - Abandoned Powerhouse in Center of Picture

APPENDIX B

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam MILL STREET DAM

I.D. # N.Y. 775

Location: Town AUBURN County CAYUGA

Stream Name OWASCO LAKE OUTLET

Tributary of

Latitude (N) Longitude (W)

Hazard Category C

Date(s) of Inspection 8/2/79

Weather Conditions 80° THUNDERSTORMS

b. Inspection Personnel R. WARRENDER W. LYNICK

c. Persons Contacted MICHAEL O'NEIL - CITY ENGINEER

d. History:

Date ~~Constructed~~ RECONSTRUCTED 1972

Owner CITY OF AUBURN

Designer KONSKI ENGINEERS

Constructed by

2) Technical Data

Type of Dam MASONRY & CONCRETE

Drainage Area 208 SQ MILES

Height 25' Length 277

Upstream Slope Downstream Slope

c. Abutments

(1) Erosion at Embankment and Abutment Contact SURFACE SOILS EROSION UPSTREAM AT WEST END OF DAM - SURFACE RUNOFF CREATED GULLY ALONG BASE OF BRIDGE SLAB

(2) Seepage along Contact of Embankment and Abutment

(3) Seepage at toe or along downstream face

d. Downstream Area - below ~~embankment~~ dam

RIP-RAP SLOPES TRANSITION INTO NATURAL CHANNEL ABOUT 200' DOWNSTREAM OF DAM - UP ABOUT 7' FROM BOTTOM OF CHANNEL

(1) Subsidence, Depressions, etc. EROSION ON SLOPE - BETWEEN TOP OF RIPRAP & PARKING LOT - SEEDING NOT ESTABLISHED ON SLOPE

(2) Seepage, unusual growth NONE

(3) Evidence of surface movement beyond embankment toe NONE

(4) Miscellaneous

e. Drainage System

4) Instrumentation

(1) Monumentation/Surveys NONE

(2) Observation Wells NONE

(3) Weirs NONE

(4) Piezometers NONE

(5) Other

5) Reservoir

a. Slopes TREES TO EDGE OF WATERCOURSE - SLOPES IN VICINITY OF DAM ARE LINED WITH RIPRAP

b. Sedimentation SUBSTANTIAL SILTATION IN RESERVOIR

6) Spillway(s) (including Discharge Conveyance Channel)

a. General PRINCIPAL CHANNEL IN CENTER - AUXILIARY ALL ALONG DAM

b. Principle Spillway (2) ALSTHOM ATLANTIC CONSTANT-LEVEL GATES

c. Emergency or Auxiliary Spillway 5 BOX WEIR STRUCTURES - FLOW BETWEEN CREST & BOTTOM OF BRIDGE
ALSO "POWER CANAL" - VERTICAL WALLS FROM DAM TO CONTROL WEIR - BEYOND WEIR FLOW GOES INTO PENSTOCK TO POWER HOUSE. TRASH RACK AT INLET TO PENSTOCK IS CLUTTERED WITH DEBRIS

d. Condition of Discharge Conveyance Channel SATISFACTORY

e. Stability of Channel side/slopes CONCRETE SLOPES - OKAY — TOPS OF ~~SLOPES~~ WALLS OF POWER CANAL ARE IN BAD CONDITION

7) Downstream Channel

a. Condition (debris, etc.) CHANNEL FREE OF OBSTRUCTIONS

b. Slopes RIPRAP FAILURE NEAR DAM ON WEST END-EXTENDS ABOUT 10'
EROSION ON AREAS ABOVE RIPRAP ON WEST SIDE

c. Approximate number of homes CITY OF AUBURN - DOWN TOWN
SECTION

8) Reservoir Drain/Outlet

Type: Pipe _____ Conduit _____ Other RODNEY HUNT SLUICE GATE

Material: Concrete _____ Metal _____ Other _____

Size: 5'x5' Length _____

Invert Elevations: Entrance 678.5 Exit _____

Physical Condition (describe): Unobservable _____

Material: _____

Joints: _____ Alignment: _____

Structural Integrity: _____

Hydraulic Capability: SATISFACTORY

RODNEY HUNT #70998-2 S-5012

Means of Control: Gate X Valve _____ Uncontrolled _____

Operation: Operable _____ Inoperable _____ Other _____

Present Condition (describe): GATE CONTROL - OKAY
GATE EITHER NOT SEALING PERFECTLY OR OPENED SLIGHTLY

9) Structural

a. Concrete Surfaces GOOD

b. Structural Cracking NONE

c. Movement - Horizontal & Vertical Alignment (Settlement) NONE APPARENT

d. Junctions with Abutments or Embankments SATISFACTORY - ON DOWNSTREAM SIDE AT WEST END OF DAM SURFACE RUN OFF HAS CREATED A GULLY

e. Drains - Foundation, Joint, Face

f. Water passages, conduits, sluices DRAIN - SATISFACTORY

g. Seepage or Leakage NONE - MORTAR ON DOWNSTREAM FACE SATISFACTORY MORTAR - POINTING OKAY - NO MORTAR MISSING

h. Joints - Construction, etc. SATISFACTORY

i. Foundation DAM FOUNDATION APPERS OKAY

j. Abutments OKAY - EXCEPT FOR EROSION ON WEST END

k. Control Gates OKAY

l. Approach & Outlet Channels

m. Energy Dissipators (plunge pool, etc.) APRON AT DOWNSTREAM TOE UNDERMINED AT WEST END - >6' AT END - ABOUT 2' UNDER DOWNSTREAM APRON PORTION DIRECTLY D/S @ EAST AUTOMATIC GATE

n. Intake Structures

o. Stability

p. Miscellaneous WATERLINE downstream of dam on 3 PIERS of TRUSS BRIDGE IN CHANNEL.

APPENDIX C

HYDROLOGIC/HYDRAULIC ENGINEERING DATA AND COMPUTATIONS

MILL STREET DAM
NY-775

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

AREA-CAPACITY DATA:

	Elevation (ft.)	Surface Area (acres)	Storage Capacity (acre-ft.)
1) Top of Dam	702.0	24	255
2) Design High Water (Max. Design Pool)	NA		
3) Auxiliary Spillway Crest	696.6	17	137
4) POWER CANAL WEIR [redacted]	695.92	NA	
Flashboards	NA		
5) (PRINCIPAL) Service Spillway Crest	689.94	—	55

DISCHARGES - (COMPUTED)

	Volume (cfs)
1) Average Daily	
2) AUXILIARY Spillway @ Maximum High Water (702.0)	5964
3) Spillway @ MAXIMUM [redacted] High Water (702.0)	2360
4) PRINCIPAL Spillway @ Auxiliary Spillway Crest Elevation	1266
5) Low Level Outlet @ PRINCIPAL SPILLWAY CREST	403
6) Total (of all facilities) @ Maximum High Water (702.0)	10952
7) Maximum Known Flood	NA
8) At Time of Inspection - WATER SURFACE @ 696.4	GATES - OPERATING

CREST: ELEVATION: 702.0

Type: CONCRETE FOOT BRIDGE OVER MASONRY & CONCRETE GRAVITY STRUCTURE

Width: 12' Length:

Spillover 2 AUTOMATIC GATES ; 6 OGEE-CRESTED WEIRS

Location ACROSS ENTIRE STRUCTURE

SPILLWAY:

PRINCIPAL		AUXILIARY [redacted]
689.94	Elevation	696.6
2 CONSTANT-LEVEL UPSTREAM AUTOMATIC GATES (AMIL)	Type	WEIR
TRAPEZOIDAL (8.21' – 15.58')	Width	19.5' EACH 117' TOTAL (NET)
	Type of Control	
	Uncontrolled	✓
	Controlled:	
MANUF. – ALSTHOM ATLANTIC INC.	Type	OGEE-SHAPED CREST WITH 45° SLOPING UPSTREAM FACE ([redacted] gate)
2	Number	6
MAX. OPENING – 7.35'	Size/Length	MAX. OPENING – 4.4'
	Invert Material	CONCRETE
	Anticipated Length of operating service	NA
NA	Chute Length	NA
NA	Height Between Spillway Crest & Approach Channel Invert (Weir Flow)	2'

HYDROMETEROLOGICAL GAGES:

	UPSTREAM - USGS #04235396	DOWNSTREAM - USGS #04235500
Type :	NON-RECORDING	
Location:	2.7 MILES @ QUASCO LAKE	3.1 MILES DOWNSTREAM FROM DAM
Records:		
Date -	1912 TO PRESENT	NOV. 1912 TO PRESENT
Max. Reading -	6/25/72 (DATUM = MSL)	6/23/72 Q = 3250 cfs

FLOOD WATER CONTROL SYSTEM:

Warning System: NONE APPARENT

Method of Controlled Releases (mechanisms):

RESERVOIR DRAIN (RODNEY HUNT SLUICE GATE)

PRINCIPAL SPILLWAY - 2 GATES (AMIL)

DRAINAGE AREA: 208 SQUARE MILES

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: FORESTED - FARMLAND

Terrain - Relief: STEEP

Surface - Soil: RELATIVELY PERMEABLE SCS SOIL GROUP B - HONEOYE & LANSING C - LANGFORD

Runoff Potential (existing or planned extensive alterations to existing (surface or subsurface conditions)

NA

Potential Sedimentation problem areas (natural or man-made; present or future)

NA

Potential Backwater problem areas for levels at maximum storage capacity including surcharge storage:

HOMES ALONGSIDE EXISTING CHANNEL OF QUASCO OUTLET

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the Reservoir perimeter:

Location: NA

Elevation:

Reservoir:

Length @ Maximum Pool <0.9 (Miles)

Length of Shoreline (@ Spillway Crest) NA (Miles)

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
MILL ST. DAM	1/		
SUBJECT		COMPUTED BY	DATE
		WCL	9/11/79

DRAINAGE AREA:

[CORPS ENGRS DES. MEMO. FOR OUASCO LAKE OUTLET PROJECT 5/1960]

OUASCO LAKE = 204 SQ MILES

DIST. FROM LAKE TO OUASCO LAKE OUTLET DAM = 1.5 MILES
TOTAL " " " TO OUTLET = 17 MILES
TOTAL ADDITIONAL DRAINAGE AREA TO " = 211 SQ MILES

DIST. OUASCO LAKE OUTLET DAM TO MILL ST DAM = 4950' = 0.94 MILES

ADDITIONAL DR AREA (LAKE TO DAM) =

$$\frac{1.8 + 0.94}{17} = \frac{DA}{211} \Rightarrow DA = 3.4 \text{ SQ MILES}$$

TOTAL AREA (DAM) = 207.4 SQ MILES

[USGS WATER DATA REPORT 76-1 1977]

GAGE = 04235390 2.74 MILES UPSTREAM FROM DAM

DA = 205 SQ MILES
+ 3.4
208.4 SQ MILES

USE 209 SQ MILES

TRANSPOSITION FACTOR: $TF = 1 - \frac{0.3005}{(DA)^{.1776}}$

TF = 0.883

I.D. # NY-775

DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
1776 NIAGARA STREET
BUFFALO, NEW YORK 14207

NEW YORK STATE
DEPT OF ENVIRONMENTAL CONSERVATION

NCBED-PH

14 July 1975

'75 JUL 16 PM 3 00

CONSTRUCTION MANAGEMENT

George Koch, Senior Hydraulic Engineer
Bureau of Facilities & Construction Mgmt.
New York State Dept. of Environmental
Conservation
50 Wolf Road
Albany, NY 12233

Dear Mr. Koch:

This is in reply to your letter, dated 25 June 1975, requesting available hydrologic and hydraulic data for Owasco Lake and Outlet.

A search of our files revealed that we have not determined an outlet capacity or a spillway design flood for the State Dam. However, rating curves and stage, storage, area, and outflow data have been developed under the direction of Mr. Allan Tedrow, Chief, Program Development Group, New York State Department of Environmental Conservation. I suggest you contact Mr. Tedrow regarding these data.

In June 1962, a local flood protection project was completed on Owasco Lake Outlet. Inclosure 1 is a copy of the Design Memorandum, dated May 1960, for this project. Improvements to the State Dam discussed in this memorandum were to have been made by local interests.

I am also inclosing unit and standard project flood hydrograph data for Owasco Lake developed by the Buffalo District under the Section 214 Program. These data may be of use to you in determing a spillway design flood inflow hydrograph. Flood routings can then be accomplished using Mr. Tedrow's stage-storage data to determine the resultant outflow.

I trust this information will be of assistance to you.

Sincerely yours,

BERNARD C. HUGHES
Colonel, Corps of Engineers
District Engineer

Incl
as stated

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

OSWEGO BASIN-STANDARD PROJECT STORM CENTERED ON SUB-BASIN C
DEVLPMNT OF FLOOD HYD. GRAPH ON AREA C-1(OMASCO) (F) D.A.=201SM
TC,R FROM GENRL/D STUDY OF OSWEGO BSN 23-JA-1211 67

ISTA	NHT	NUHGO	NCLRK	IPNCH	ORCSN	EXTA	RTIMP
-0	1	56	-0	-0	-0	1.50	.047

DA	TR	TP	CP	TC	RTIOR	RTIOL	RCVRY	E
201.00	60.00	-0.00	-0.000	-0.00	1.00	-0.00	-0.00	-0.00

STANDARD PROJECT FLOOD HYDROGRAPH ON AREA C-1

UNIFORM loss rate INITIAL LOSSES

NP	BASEL	DELTAL	STARTN	STORM	SPFF	PMS	TWSPC	TRSDA
96	.02	.50	121	-0.00	9.50	-0.00	1.000	606.00

HR	MIN	RAIN	LOSS	EXCESS	UNIT HG	RECSN	FLOW
1	0	0.00	0.00	0.00	21353	121	121
2	0	0.00	0.00	0.00	6351	121	121
3	0	0.00	0.00	0.00	1989	121	121
4	0	0.00	0.00	0.00	2517	121	121
5	0	0.00	0.00	0.00	3250	121	121
6	0	0.00	0.00	0.00	4340	121	121
7	0	.01	.01	0.00	5353	121	121
8	0	.01	.01	0.00	5916	121	121
9	0	.01	.01	0.00	6153	121	121
10	0	.01	.01	0.00	6176	121	121
11	0	.01	.01	0.00	5971	121	121
12	0	.01	.01	0.00	5700	121	121
13	0	.03	.03	0.00	5390	121	121
14	0	.03	.03	0.00	4948	121	121
15	0	.04	.04	0.00	4468	121	121
16	0	.10	.10	0.00	4017	121	121
17	0	.04	.04	0.00	3611	121	121
18	0	.03	.03	0.00	3246	121	121
19	0	0.00	0.00	0.00	2919	121	121
20	0	0.00	0.00	0.00	2624	121	121
21	0	0.00	0.00	0.00	2359	121	121
22	0	0.00	0.00	0.00	2120	121	121
23	0	0.00	0.00	0.00	1906	121	121
24	0	0.00	0.00	0.00	1714	121	121
25	0	.01	.01	0.00	1541	121	121
26	0	.01	.01	0.00	1385	121	121
27	0	.01	.01	0.00	1245	121	121
28	0	.01	.01	0.00	1119	121	121
29	0	.01	.01	0.00	1006	121	121
30	0	.01	.01	0.00	905	121	121
31	0	.03	.03	0.00	813	121	121
32	0	.03	.03	0.00	731	121	121
33	0	.03	.03	0.00	657	121	121
34	0	.03	.03	0.00	591	121	121
35	0	.03	.02	.01	531	121	335
36	0	.03	.02	.01	478	121	308
37	0	.12	.02	.10	429	121	2340
38	0	.14	.02	.12	386	121	3364
39	0	.18	.02	.16	347	121	4556
40	0	.45	.02	.43	312	121	10885
41	0	.17	.02	.15	280	121	7047
42	0	.13	.02	.11	252	121	5617
43	0	.01	.01	0.00	227	121	3897
44	0	.01	.01	0.00	204	121	4166
45	0	.01	.01	0.00	183	121	5055

1-Hr. Unit Hydrograph

SPF INFLOW HYDROGRAPH

INCL 2 1 of 3

46	0	.01	.01	0.00	165	121	5851	
47	0	.01	.01	0.00	148	121	6309	
48	0	.01	.01	0	133	121	6701	
49	0	.04	.02	.02	120	121	7050	
50	0	.04	.02	.02	108	121	6984	
1	0	.04	.02	.02	97	121	6720	
52	0	.04	.02	.02	87	121	6393	
53	0	.04	.02	.02	78	121	6013	
54	0	.04	.02	.02	70	121	5629	
55	0	.15	.02	.13	63	121	7624	
56	0	.15	.02	.13	57	121	8013	
57	0	.15	.02	.13		121	7969	
58	0	.15	.02	.13		121	8022	
59	0	.15	.02	.13		121	8187	
60	0	.15	.02	.13		121	8498	
61	0	.68	.02	.66		121	20259	
62	0	.82	.02	.80		121	27138	
63	0	1.02	.02	1.00		121	33914	
64	0	2.58	.02	2.56		121	70684	PeAH
65	0	.95	.02	.93		121	48823	
66	0	.75	.02	.73		121	41105	
67	0	.08	.02	.06		121	30826	
68	0	.08	.02	.06		121	32370	
69	0	.08	.02	.06		121	37598	
70	0	.08	.02	.06		121	42243	
71	0	.08	.02	.06		121	45310	
72	0	.08	.02	.06		121	46692	
73	0	0.00	0.00	0.00		121	45377	
74	0	0.00	0.00	0.00		121	43820	
75	0	0.00	0.00	0.00		121	41868	
76	0	0.00	0.00	0.00		121	39451	
77	0	0.00	0.00	0.00		121	36662	
78	0	0.00	0.00	0.00		121	33545	
79	0	.01	.01	0.00		121	30479	
80	0	.01	.01	0.00		121	27582	
81	0	.01	.01	0.00		121	24916	
82	0	.01	.01	0.00		121	22481	
83	0	.01	.01	0.00		121	20265	
84	0	.01	.01	0.00		121	18254	
85	0	.05	.02	.03		121	17069	
86	0	.06	.02	.04		121	15827	
87	0	.07	.02	.05		121	14684	
88	0	.18	.02	.16		121	15861	
89	0	.06	.02	.04		121	12942	
90	0	.05	.02	.03		121	11297	
91	0	.01	.01	0.00		121	9898	
92	0	.01	.01	0.00		121	9148	
93	0	.01	.01	0.00		121	8662	
94	0	.01	.01	0.00		121	8219	
95	0	.01	.01	0.00		121	7750	
96	0	.01	.01	0.00		121	7237	
97	0					121	6723	
98	0					121	6199	
99	0					121	5693	
100	0					121	5204	
101	0					121	4729	
102	0					121	4278	
103	0					121	3862	
104	0					121	3485	
105	0					121	3144	
106	0					121	2839	INCL 2 2 OF 3

107	0				121	2564	
108	0				121	2[illegible]5	2340
109	0				121	2[illegible]	2117
110	0				121	1893	
111	0				121	1707	
112	0				121	1541	
113	0				121	1392	
114	0				121	1256	
115	0				121	1134	
116	0				121	1025	
117	0				121	899	
118	0				121	780	
119	0				121	663	
120	0				121	477	
121	0				121	394	
122	0				121	329	
123	0				121	305	
124	0				121	283	
125	0				121	264	
126	0				121	246	
127	0				121	231	
128	0				121	216	
129	0				121	207	
130	0				121	198	
131	0				121	190	
132	0				121	183	
133	0				121	177	
134	0				121	171	
135	0				121	166	
136	0				121	162	
137	0				121	158	
138	0				121	154	
139	0				121	151	
140	0				121	148	
141	0				121	143	
142	0				121	139	
143					121	135	
144	0				121	125	
145	0				121	123	
146	0				121	121	
147	0				121	121	
148	0				121	121	
149	0				121	121	
150	0				121	121	
151	0				121	121	
TOTAL		10.83	1.45	9.38	129139	18271	1229595

JNCL 2 3 of 3

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
MILL ST DAM	21		
SUBJECT		**COMPUTED BY**	**DATE**
HYDROGRAPH PARAMETERS		WCL	9/11/79

1) USE HYDROGRAPH GENERATED FROM OWASCO LAKE OUTLET DAM ANALYSIS

2) SNYDER UH:

LAG TIME:

$t_p = C_t (L \times L_{CA})^{0.3}$

$t_p = 4(30.7 \times 16.35)^{0.3}$

$t_p = 26.3$ HRS

$L = 30 + 2.7 = 32.7$

$L_{CA} = 0.5L = 16.35$

USE $C_t = 4$

UNIT RAINFALL DURATION:

$t_r = \frac{t_p}{5.5} = \frac{26.3}{5.5} = 4.78$ HRS [USE 5 HRS = t_R]

(DOES NOT RUN: USE 3 HRS)

ADJUSTED LAG TIME:

$T_p = t_p + 0.25(t_R - t_r)$

$= 26.3 + 0.25(5 - 4.78)$

$TP = 26.2$ HRS

USE $C_p = 0.625$

OWASCO LAKE OUTLET DAM

SOIL LOSS DATA:

INITIAL LOSS = 1.0"/HR CONSTANT LOSS = 0.5"/HR

BASE FLOW: @ 2 cfs/SQ MI @ DA TOTAL = 416 cfs

PMP - PRECIPITATION:

	200 SQ-MI 24 HR	DURATION - % OF 24 HR 6	12	24	48
@ DAM	21"	78	90	100	108

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
MILL ST DAM	3/		
SUBJECT		**COMPUTED BY**	**DATE**
STAGE - STORAGE DATA		WCL	9/11/79

REF: PHASE II RECONSTRUCTION DESIGN REPORT
PERMIT APPLICATION NO. 706-01-0053 A PHASE E
9/23/76 5/20/75

STAGE	SURFACE AREA (ACRES)	VOLUME (AC-FT)
685		21
690	—	55
695	—	113.5
696.6	17	137
699	21	185
702	24	254
702.06	—	255.4

69 Y — 23 AC-FT/FT — Y

ΔV = 1.4

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
MILL ST DAM	4/		
SUBJECT		**COMPUTED BY**	**DATE**
STAGE - DISCHARGE DATA : OUTLET GATE (RESV. DRAIN)		WCL	9/11/79

SIZE: 5' x 5' = 25 FT² L = 5'

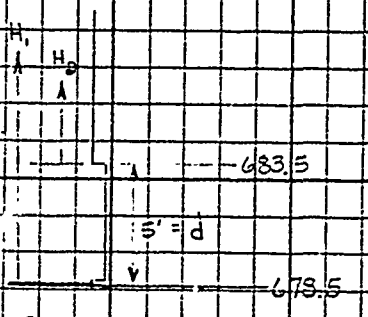
ELEV. - INVERT 678.5

- CROWN 683.5

$Q = CA\sqrt{2gH}$ C = 0.65 (RECESSED 1'-6") [SUBMERGED ORIFICE - SERIES 3 FIG 309 BUREC - DES. OF SMALL DAMS (2ND ED.) 1977]

OR

$Q = \frac{2}{3}\sqrt{2g}\, CL\left(H_1^{3/2} - H_2^{3/2}\right)$



$Q = 26.75\, C\left(H_1^{3/2} - H_2^{3/2}\right)$

C VARIES WITH H_1 (BUREC FIG 257)

	STAGE	H_1	d/H_1	C	$H_1^{3/2}$	H_2	$H_2^{3/2}$	Q
CREST OF GATES	689.94	11.44	0.437	.674	38.69	6.44	16.34	403
	690	11.5	0.435	.674	39.0	6.5	16.57	404
CREST CANAL WEIR	695.92	17.42	0.287	.689	72.71	12.42	43.77	533
	696	17.5	0.286	.689	73.21	12.5	44.19	535
NWS	696.5	18	0.278	.69	76.37	13	46.87	544
CREST AUX. SPILLWAY	696.6	18.1	0.276	.691	77.0	13.1	47.41	547
	697	18.5	0.27	.691	79.57	13.5	49.60	554
	697.29	18.79	0.266	.692	81.45	13.79	51.21	560
BOTTOM BRIDGE	701	22.5	0.222	.696	106.72	17.5	73.21	694
TOP CROWN	702	23.5	0.213	.698	113.92	18.5	79.57	741
	702.06	23.56	0.212	.698	114.36	18.56	79.96	742

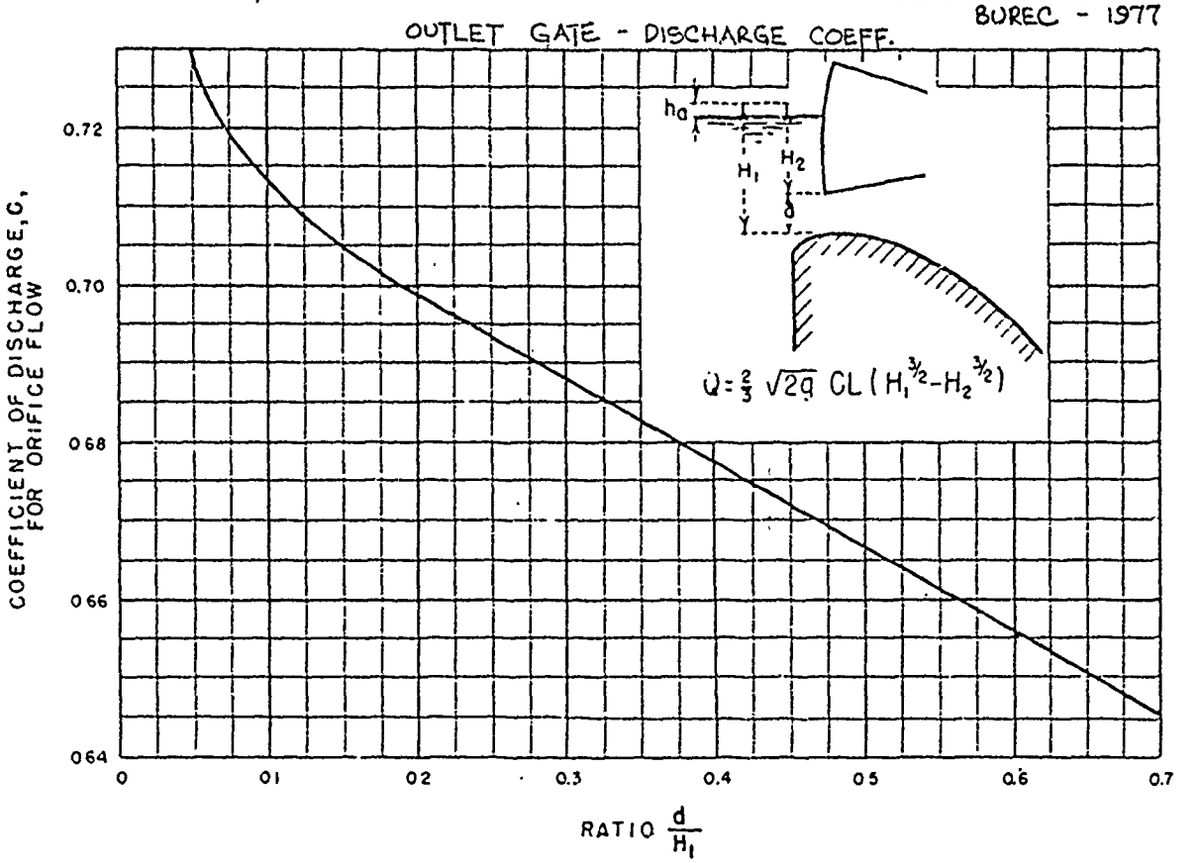


Figure 257. Coefficient of discharge for flow under gates. 288-D-2417.

is the inflow per foot of length of weir crest. The momenta[3] at the two sections therefore will be:

$$\text{Upstream, } M_u = \frac{Qv}{g} \tag{8}$$

$$\text{Downstream, } M_d = \frac{[Q+q(\Delta x)]}{g}[v+\Delta v] \tag{9}$$

Subtracting equation (8) from equation (9):

$$\Delta M = \frac{Q(\Delta v)}{g} + \frac{q(\Delta x)}{g}[v+\Delta v] \tag{10}$$

Dividing by Δx:

$$\frac{\Delta M}{\Delta x} = \frac{Q(\Delta v)}{g(\Delta x)} + \frac{q}{g}[v+\Delta v] \tag{11}$$

[3] The weight of 1 cubic foot of water is taken as a unit force to eliminate the necessity of multiplying all forces and momenta by 62.5 to convert them into pounds.

The rate of change of momentum with respect to time being v times the rate of change with respect to x, and considering the average velocity to be $\left[v+\frac{1}{2}(\Delta v)\right]$, equation (11) can be written:

$$\frac{\Delta M}{\Delta t} = \frac{Q(\Delta v)}{g(\Delta x)}\left[v+\frac{1}{2}(\Delta v)\right] + \frac{q}{g}[v+\Delta v]\left[v+\frac{1}{2}(\Delta v)\right] \tag{12}$$

As $\frac{\Delta M}{\Delta t}$ is the accelerating force, which is equal to the slope of the water surface $\frac{\Delta y}{\Delta x}$ times the average discharge, equation (12) becomes:

$$\frac{\Delta y}{\Delta x}\left[Q+\frac{1}{2}(\Delta Q)\right] = \frac{Q(\Delta v)}{g(\Delta x)}\left[v+\frac{1}{2}(\Delta v)\right] + \frac{q}{g}[v+\Delta v]\left[v+\frac{1}{2}(\Delta v)\right] \tag{13}$$

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

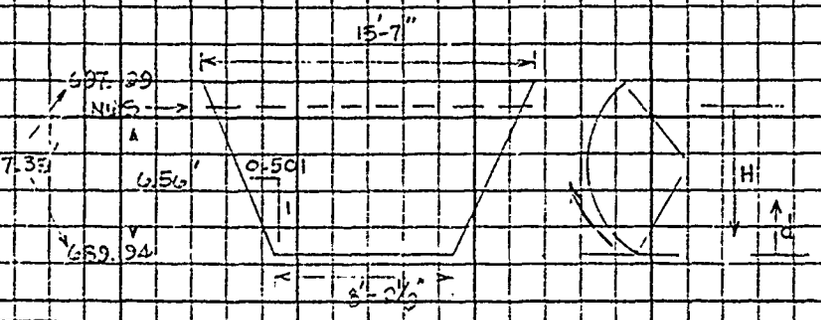
JOB	SHEET NO.	CHECKED BY	DATE
MILL ST DAM	5/		
SUBJECT		**COMPUTED BY**	**DATE**
STAGE - DISCHARGE : CONSTANT-LEVEL GATES (2)		WCL	9/12/79

CONDITION:

NORMAL WATER SURFACE @ ELEV 696.5

ELEV - CREST 689.94 BOTTOM WIDTH = 8'-2½" = 8.21'

TOP 697.29 TOP " = 15'-7" = 15.58'



$Q = CA\sqrt{2gH} = 4.815A\sqrt{H}$ ORIFICE FLOW

C = 0.6 H MEASURED TO CENTER OF ORIFICE OPENING

A VARIES WITH HEIGHT OF OPENING

WATER SURFACE - CONSTANT LEVEL @ ELEV. 696.5

	ELEV BOT.-GATE	d	OPENING TOP WIDTH	L_{AVE}	A	H	Q	2Q (2-GATES)
	689.94	—	8.21	8.21	—	—	—	-0-
	690	0.06	8.27	8.24	0.49	6.53	6	12
CANAL WEIR	695.90	5.98	14.20	11.205	67.01	3.57	610	1220
	696	6.06	14.29	11.245	68.14	3.53	616	1232
NWS	696.5	6.56	14.78	11.495	75.41	3.28	659	~~1316~~ 1320

$\frac{5}{6}(1320 - 1232) = 28$

SHT #6

REVISED - SEE SHT 5A

GA-17 (4/70) NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
MILL ST. DAM	5A		
SUBJECT		**COMPUTED BY**	**DATE**
STAGE-DISCHARGE : CONSTANT-LEVEL GATES (2)		WCL	9/27/79

DESIGN DATA – ALSTHOM ATLANTIC INC. REC'D – 9/26/79

INSTALLED GATES = AMIL D450 UNITS [INDEX # D = 450]

Q_{MAX} = 470 cfs FOR HEAD DIFFERENTIAL > 3' WITH DOWNSTREAM WATER SURFACE SUBMERGING GATE SILL

IF INFLOW Q EXCEEDS Q-GATE:

MAX WATER SURFACE ELEV. TO AVOID GATE OVERTOPPING = ELEV. OF AXIS OF ROTATION + 0.009 D

OVERTOPPING ELEV. = 696.5 + 0.009(450) = 700.55 ←
4.05

Q_{OT} (ELEV 700.55) = $\frac{4}{3} Q_{MAX}$ = $\frac{4}{3}$ (470) = 626.7 cfs ←

2 GATES Q_{OT} = 1253 cfs

REVISED DISCHARGE CAPACITY: $Q = CA\sqrt{2gH} = 3.443A\sqrt{H}$

	ELEV. BOT. GATE	d	OPENING TOP WIDTH	L_{AVE}	A	H_1	Q	(2-GATES) 2Q
	689.94	—	8.21	8.21	—	—	—	-0-
	690	0.06	8.27	8.24	0.49	6.53	4	8
CANAL WEIR	695.92	5.98	14.20	11.205	67.01	3.57	436	872
	696	6.06	14.28	11.245	68.14	3.53	441	882
NOS	696.5	6.56	14.78	11.495	75.41	3.28	470	940 ←

$$C = \frac{Q}{A\sqrt{2gH}} = \frac{470}{75.41\sqrt{2g(3.28)}} = 0.429$$

GA-17 (4/70) NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
MILL ST. DAM	58		
SUBJECT		**COMPUTED BY**	**DATE**
STAGE - DISCHARGE: CONSTANT-LEVEL GATES (2)		WCL	9/27/79

STAGE		Q COEFF.	Q		2Q
696.5		1.0	470	← (SHT 5A)	940
	0.1				
696.6		1.008	474		948
	0.4				
697		1.041	489		978
	0.29				
697.29		1.065	501		1002
	3.26				
700.55		1.333	626.7	← (SHT 5A)	1253
	Σ = 4.05'				

ORIFICE FLOW ←

[ABOVE ELEV. 700.55: $Q = CA\sqrt{2gH} = 231.47\sqrt{H}$

GATE - FULLY OPEN $A = 75.41\ ft^2$ w/ GATE BOTTOM @ 696.5 = NWS

CENTER ORIFICE ELEV @ 693.22 — GATE SILL @ 689.94

FOR ELEV. 700.55 $H = 7.33'$

$Q = 626.7$ cfs

$$C = \frac{Q}{A\sqrt{2gH}} = \frac{626.7}{75.41\sqrt{2g(7.33)}} = 0.3595$$

(REF = 693.22)

STAGE	H	Q	2-Q
700.55	7.33	626.7	1253
701	7.78	646	1292
702	8.78	686	1372
702.06	8.84	688	1376

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
MILL ST DAM	6/		
SUBJECT		**COMPUTED BY**	**DATE**
STAGE - DISCHARGE : CONSTANT-LEVEL GATES (2)		WCL	9/10/79

CONDITION: GATES FIXED W/ BOTTOM @ ELEV. 696.5 (NWS)

ORIFICE FLOW

WATER SURFACE RISES: (ELEV. 696.5 — 702.0)

OPENING AREA = 75.41 FT^2 OR L_{AVE} = 11.495'

OPENING HT = 6.56'

SHT 4A (REF: - FIG 257)

$$Q = \frac{2}{3}\sqrt{2g}\; C L \left(H_1^{3/2} - H_2^{3/2}\right) = 11.492\, C \left(H_1^{3/2} - H_2^{3/2}\right)$$

L = 11.495' d = 6.56'

C VARIES WITH H_1

REF = 6.892'

REVISED - SEE SHT 5B

STAGE	H_1	d/H_1	C	$H_1^{3/2}$	H_2	$H_2^{3/2}$	Q	2Q
696.5	—				—		—	
696.70	6.66	0.98	—	17.19	0.10	0.03	633	1266
697	7.06	0.93	[0.6 MIN]	19.76	0.50	0.35	679	1358
697.29	7.35	0.89	—	19.93	0.79	0.70	710	1420
701	11.26	0.593	0.657	36.78	4.5	9.55	1100	2200
702	12.06	0.544	0.662	41.98	5.5	12.90	1180	2360
702.06	12.12	0.541	0.662	42.19	5.56	13.11	1184	2368

ONE REQD - GATE SIDEWALLS BETWEEN GATE & BRIDGE PIERS:

$Q = C L H^{3/2}$ BROAD-CRESTED WEIR C = 3.1 $Q = 42.625\, H^{3/2}$

L = (17.5 - 3.15) = 13.75' (ONE SIDEWALL)

STAGE	H	Q	2Q
697.29	—	—	
701	3.71	305	610
702	4.71	436	872
702.06	4.77	444	888

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
MILL ST DAM	7/		

SUBJECT	COMPUTED BY	DATE
STAGE - DISCHARGE : AUXILIARY SPILLWAY	WCL	9/18/79

OGEE SHAPED WITH 1:1 SLOPING UPSTREAM FACE

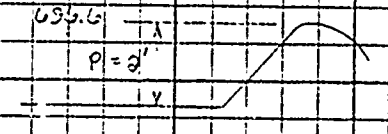
$Q = CLH^{3/2}$ $\quad L = L' - 2(NK_p + K_a)H$ $\quad$ WEIR FLOW

$L' = 117'$ (NET) $\quad N = 5$ (PIERS)
2 - ABUTMENTS
$K_p = 0.02$
$K_a = 0.1$
½ BAYS @ 19.5'

$L = 117 - 0.4H$

(BUREC) (FIG. 249) $Q = C_o L H_o^{3/2}$
(DESIGN RPM) $H_o = 2'$ $\quad P/H_o = 1.0$ $\quad C_o = 3.98$
(VERTICAL FACE)

(BUREC) (FIG. 251) $P/H_o = 1.0$ $\quad C_{INCL}/C_{VERT} = 0.998$
FOR 1:1 SLOPING FACE



$H_o = 2'$ $\quad$ (INCLINED) $C_o = 3.97$ $\quad$ (BUREC FIG 250) $\quad L = 117 - 0.4H$

	STAGE	H	H/H_o	C/C_o	C	L	Q
	696	—				117	—
	697	0.4	0.2	0.353	3.30	116.8	98
	697.39	0.69	0.345	0.299	3.44	116.7	230
	701	4.4	2.2	1.07 (MIN)	4.14	115.2	44.22
TOP	702	5.4	2.7	1.07	4.14	114.8	59.64
CROWN	702.06	5.46	2.73	1.07	4.14	114.8	60.64

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
MILL ST DAM	8/		
SUBJECT		**COMPUTED BY**	**DATE**
STAGE - DISCHARGE : 1) POWER CANAL WEIR 2) WEIR FLOW OVER BRIDGE		WCL	9/12/79

1) POWER CANAL WEIR :

$Q = CLH^{3/2}$ L = 24' $Q = 74.4 H^{3/2}$ WEIR FLOW

C = 3.1

STAGE	H	Q
695.92	—	—
696	0.08	1.7
696.5	0.58	32
696.6	0.68	42
697	1.08	84
697.09	1.17	119
701	5.08	252
702	6.08	1115
702.06	6.14	1132

2) WEIR FLOW OVER BRIDGE :

$Q = CLH^{3/2}$ L = 307

C = 3.087

OVER FLOW ELEV = 702

w/ CROWN + " " = 702.06

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
MILL ST DAM	9/		
SUBJECT		**COMPUTED BY**	**DATE**
STAGE - DISCHARGE : SUMMARY		WCL	9/12/79

	STAGE	OUTLET GATE (RESV. DRAIN)	CONSTANT LEVEL GATES 2-GATES	CONSTANT LEVEL GATES SIDEWALL OVERFLOW	AUXILIARY SPILLWAY	POWER CANAL WEIR	(OUTLET GATE CLOSED) TOTAL	
	689.94	403	—0—				—0—	—0—
	690	404	12	8			12	8
	695.92	523	1290	372		—0—	1290	372
	696	525	1322	332		2	1324	334
NWS	696.5	544	1360	940		22	1397	973
[illegible]	696.6	547	1364	949	—0—	42	1309	990
	697	554	1352	979	92	124	1544	1160
	697.99	560	1400	1003	—0—	2130	1769	1351
	701	694	2300	1092	610	4402	2502	7156
TOP	702	641	2360	1372	2720	5964	1621	9323
CROWNED TOP	702.06	642	2368	1374	2838	6064	1124	9460
			REVISED SHTS 5A 5B				REVISED	

```
*****************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)
MODIFIED VERSION      JULY 1976
  LAST MODIFICATION  26 FEB 79
  MODIFIED FOR HONEYWELL APR 79
*****************************

*****************************
THIS PROGRAM IS CURRENTLY BEING MODIFIED
TO RUN ON THE DCS HONEYWELL SYSTEM

PLEASE REPORT ANY UNUSUAL OPERATING PROBLEMS
TO MR. TILLSON (ext. 423) PH 7-5466
*****************************
```

1	A	HILL STREET DAM		HY-775				OSWEGO RIVER BASIN			
2	A			CITY OF AUBURN				CAYUGA COUNTY			
3	A			HMF - CORPS ENGRS SPF-UH FOR OWASCO LAKE OUTLET DAM							
4	B	100	1	0	0	0	0	0	0	0	0
5	B1	5									
6	J	1	4	1							
7	J1	0.92	0.94	1	2						
8	K	0	1					1			
9	K1			INFLOW HYDROGRAPH - OWASCO LAKE OUTLET							
10	H	-1		207		207	0.88			1	
11	N	121	121	121	121	121	335	398	2340	3364	4556
12	N	10815	7097	5617	3397	4166	5055	5851	6309	6701	7050
13	N	6934	6720	6393	6013	5629	7624	8013	7969	8022	8187
14	N	8498	20259	27138	33914	70684	48823	41105	30826	32370	37598
15	N	42243	45310	46692	45377	43820	41868	39451	36602	33545	30479
16	N	27582	24915	22481	20265	18254	17069	15827	14684	15861	12942
17	N	11297	9498	9148	8662	8219	7750	7237	6723	6199	5693
18	N	5204	4729	4278	3862	3485	3144	2839	2564	2340	2117
19	N	1893	1707	1541	1392	1256	1134	1025	899	780	663
20	N	477	394	329	305	283	264	246	231	216	207
21	N	198	190	183	177	171	166	162	158	154	151
22	N	148	143	139	135	128	123	121	121	121	121
23	N	121	121	121	121	121	121	121	121	121	121
24	N	0									
25	N	0									
26	N	0									
27	K	1	1					1			

```
28  K1   ROUTED OUTFLOW - ALL GATES FULL OPEN - INFLOW HYDROGRAPH TO MILL ST DAM
29  Y                                   1       1
30  Y1     3                                            -710.72      -1
31  Y4710.72     711     712  712.82     713  713.27     714  714.85     715  715.12
32  Y4 715.5  715.87     716   716.5     717   717.5     718
33  Y5  1287    1350    1777    2265    2388    2584    3175    3953    4106    4221
34  Y5  5053    5313    5408    5763    6188    6670    7186
35  $S  6286   12900   17712   19917   26734   33752   40970   48590   56211   64233
36  $E   709     710  710.72     711     712     713     714     715     716     717
37  $$710.72
38  $0   717   3.087     1.5      70
39  K      1       2                                       1
40  K1ROUTED HYDROGRAPH AT MILL ST DAM - NO BREACH   OUTLET GATE CLOSED-2 GATES OPEN
41  Y                                   1       1
42  Y1     1                                            -696.5      -1
43  Y4   690  695.92     696   696.5   696.6     697  697.29     701     702  702.06
44  Y5     8     472     384     973     990    1160    1351    7156    9323    9460
45  $S    21      55   113.5     137     185     254   255.4
46  $E   685     690     695   696.6     699     702  702.06
47  $$ 696.6
48  $0702.06   3.087     1.5     307
49  K     99
50  A
51  A
52  A
53  A
54  A
```

```
*****************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION       JULY 1973
  LAST MODIFICATION  26 FEB 79
  MODIFIED FOR HONEYWELL APR 79
*****************************

*****************************
THIS PROGRAM IS CURRENTLY BEING MODIFIED
TO RUN AT THE OCS HONEYWELL SYSTEM

PLEASE REPORT ANY UNUSUAL OPERATING PROBLEMS
TO MIKE TILLSON (X4, 423) PH: 7-5566
*****************************
```

MILL STREET DAM NY-775 OSWEGO RIVER BASIN
CITY OF AUBURN CAYUGA COUNTY
PMF - CORPS ENGRS SPF-UH FOR OWASCO LAKE OUTLET DAM

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
160	1	0	0	0	0	0	0	0	0

JOPER	NWT	LROPT	TRACE
5	0	0	0

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 4 LRTIO= 1

RTIOS= 0.92 0.94 1.00 2.00

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

INFLOW HYDROGRAPH - OWASCO LAKE OUTLET

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
-1	0	207.00	0.	207.00	0.88	0.	0	1	0

INPUT HYDROGRAPH

121.	121.	121.	121.	121.	335.	398.	2340.	3364.	4556.
10385.	7097.	5617.	3837.	4166.	5055.	5851.	6309.	6701.	7050.
6984.	6720.	6393.	6013.	5629.	7624.	8013.	7969.	8022.	8187.
8981.	20259.	27131.	33914.	70644.	46823.	41105.	30826.	32370.	37598.
42243.	45310.	46652.	45377.	43320.	41866.	39451.	36602.	33545.	30479.
27542.	24916.	22481.	20265.	18254.	17069.	15827.	14684.	15061.	12942.
11297.	9493.	9143.	8462.	8219.	7750.	7237.	6723.	6199.	5693.
5294.	4725.	4278.	3862.	3485.	3144.	2839.	2564.	2340.	2117.
1893.	1707.	1541.	1392.	1256.	1134.	1025.	899.	780.	663.
477.	394.	329.	305.	283.	264.	246.	231.	216.	207.
193.	190.	183.	177.	171.	166.	162.	158.	154.	151.
148.	143.	139.	135.	125.	125.	121.	121.	121.	121.
121.	121.	121.	121.	121.	121.	121.	121.	121.	121.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	70684.	43986.	35834.	16723.	1227050.
CMS	2002.	1246.	1015.	474.	34746.
INCHES		1.98	6.44	9.02	9.19
MM		50.21	163.61	229.07	233.43
AC-FT		21811.	71075.	99511.	101409.
THOUS CU M		26904.	87670.	122745.	125086.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 1

111.	111.	111.	111.	111.	304.	366.	2154.	3095.	4192.
10014.	6549.	5163.	3595.	3333.	4651.	5383.	5804.	6165.	6486.
6625.	6182.	5882.	5532.	5179.	7014.	7372.	7331.	7380.	7532.
7[illegible].	18536.	24967.	31201.	65029.	44917.	37817.	28360.	29780.	34590.
38[illegible].	41589.	42957.	41747.	40314.	38519.	36295.	33674.	30861.	28041.
25[illegible].	22923.	20[illegible].	18644.	16794.	15703.	14561.	13509.	14592.	11907.
10[illegible].	9106.	8415.	7969.	7561.	7130.	6658.	6185.	5703.	5238.
47[illegible].	4351.	2935.	3553.	3206.	2892.	2612.	2359.	2153.	1948.
1742.	1570.	1413.	1281.	1156.	1043.	943.	827.	718.	610.
43[illegible].	362.	303.	281.	260.	243.	226.	213.	199.	190.
182.	175.	168.	163.	157.	153.	149.	145.	142.	139.
136.	132.	123.	124.	115.	113.	111.	111.	111.	111.
111.	111.	111.	111.	111.	111.	111.	111.	111.	111.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	65029.	40467.	32967.	15386.	1128885.
CMS	1841.	1146.	934.	436.	31966.
INCHES		1.82	5.93	8.30	8.46
MM		46.19	150.52	210.74	214.76
AC-FT		20046.	65389.	91550.	93296.
THOUS CU M		24751.	80656.	112926.	115079.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 2

114.	114.	114.	114.	114.	315.	374.	2200.	3162.	4283.
10232.	6671.	5258.	3663.	3916.	4752.	5500.	5930.	6299.	6627.
6[illegible].	6317.	6009.	5652.	5291.	7167.	7532.	7491.	7541.	7696.
79[illegible].	19043.	25510.	31879.	66443.	45894.	38639.	25976.	30429.	35342.
39[illegible].	42571.	43890.	42654.	41191.	39356.	37034.	34400.	31532.	28650.
25927.	23431.	21132.	19049.	17159.	16045.	14877.	13803.	14909.	12165.
10[illegible].	9304.	8599.	1142.	7726.	7285.	6803.	6320.	5827.	5351.
4192.	4445.	4021.	3630.	3276.	2955.	2669.	2410.	2200.	1990.
1777.	1605.	1443.	1308.	1181.	1066.	963.	845.	733.	623.
44[illegible].	370.	3[illegible].	287.	266.	248.	231.	217.	203.	195.
185.	179.	172.	156.	161.	156.	152.	149.	145.	142.
13[illegible].	134.	131.	127.	117.	116.	114.	114.	114.	114.
114.	114.	114.	114.	114.	114.	114.	114.	114.	114.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	66443.	41347.	33684.	15720.	1153427.
CMS	1881.	1171.	954.	445.	32661.
INCHES		1.86	6.05	8.48	8.64
MM		47.19	153.79	215.32	219.43
AC-FT		20502.	66810.	93540.	95325.
THOUS CU M		25289.	82409.	115380.	117581.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 3

121.	121.	121.	121.	121.	335.	398.	2340.	3364.	4556.
10[illegible]	7[illegible]	5[illegible]	[illegible]	4[illegible]	5[illegible]	5[illegible]	6[illegible]	6701	7050

6[illegible].	6[illegible].	6[illegible].	6013.	5629.	7624.	6013.	7069.	8022.	8167.
8493.	20259.	27131.	35914.	70684.	48823.	41105.	30826.	32370.	37598.
42243.	45310.	46692.	45377.	43820.	41868.	39451.	36602.	33545.	30479.
27587.	24916.	22481.	20265.	18254.	17069.	15427.	14684.	15861.	12942.
11267.	9398.	9147.	8562.	8219.	7759.	7237.	6723.	6199.	5693.
5204.	4729.	4274.	3862.	3485.	3144.	2839.	2564.	2340.	2117.
1893.	1707.	1541.	1392.	1256.	1134.	1025.	899.	760.	663.
477.	394.	325.	305.	283.	264.	246.	231.	216.	207.
196.	190.	183.	177.	171.	166.	162.	158.	154.	151.
148.	143.	139.	135.	125.	123.	121.	121.	121.	121.
121.	121.	121.	121.	121.	121.	121.	121.	121.	121.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	78674.	43936.	35834.	16723.	1227050.
CMS	2062.	1246.	1015.	474.	34746.
INCHES		1.98	6.44	9.02	9.19
MM		50.21	163.61	229.07	233.43
AC-FT		21811.	71075.	99511.	101409.
THOUS CU M		26904.	87670.	122745.	125086.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 4

242.	242.	242.	242.	242.	670.	796.	4680.	6726.	9112.
21770.	14194.	11234.	7794.	8332.	10110.	11702.	12618.	13402.	14100.
13963.	13490.	12746.	12926.	11258.	15248.	16026.	15938.	16044.	16374.
16706.	40518.	54279.	67423.	141368.	97646.	82210.	61652.	64740.	75196.
64455.	36620.	93384.	90754.	87640.	83736.	78902.	73204.	67090.	60958.
55184.	49832.	44962.	40530.	36508.	34138.	31054.	29368.	31722.	25684.
22594.	19776.	16296.	17324.	16438.	15500.	14474.	13446.	12396.	11386.
10408.	9468.	8586.	7724.	6970.	6288.	5678.	5128.	4680.	4234.
3726.	3414.	3082.	2784.	2512.	2266.	2050.	1798.	1560.	1326.
954.	788.	658.	610.	566.	528.	492.	462.	432.	414.
396.	380.	366.	354.	342.	332.	324.	316.	308.	302.
296.	286.	272.	270.	250.	246.	242.	242.	242.	242.
242.	242.	242.	242.	242.	242.	242.	242.	242.	242.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	141368.	87971.	71667.	33447.	2454099.
CMS	4003.	2491.	2029.	947.	69492.
INCHES		3.95	12.88	18.04	18.36
MM		100.41	327.22	453.13	466.87
AC-FT		43622.	142150.	199022.	202818.
THOUS CU M		53807.	175339.	245490.	250172.

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

ROUTED OUTFLOW - ALL GATES FULL OPEN - INFLOW HYDROGRAPH TO MILL ST DAM

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.	0.	0.	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
3	0	0	0. 0.	0.		-711.	-1

STAGE	710.72	711.00	712.00	712.82	713.00	713.27	714.00	714.85	715.00	715.12
	715.50	715.87	716.00	716.50	717.00	717.50	718.00			
FLOW	1237.00	1350.00	1777.00	2265.00	2388.00	2584.00	3175.00	3953.00	4106.00	4221.00
	5053.00	5313.00	5409.00	5763.00	6188.00	6670.00	7186.00			
CAPACITY=	6286.	12900.	17712.	19917.	26734.	33752.	40970.	48590.	56211.	64233.
ELEVATION=	709.	710.	711.	711.	712.	713.	714.	715.	716.	717.

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
710.7	0.	0.	0.	0.	0.	0.	0.

6

DAM DATA

TOPEL	COQD	EXPD	DAMWID
717.0	3.1	1.5	70.

STATION 1, PLAN 1, RATIO 1

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

1287.	1287.	1287.	1287.	1287.	1287.	1287.	1287.	1287.	1287.
1291.	1307.	1318.	1325.	1331.	1337.	1346.	1363.	1387.	1412.
1439.	1464.	1487.	1509.	1529.	1552.	1582.	1611.	1641.	1671.
1792.	1761.	1896.	2079.	2421.	2888.	3247.	3542.	3794.	4069.
4329.	5205.	5487.	5756.	6062.	6393.	6761.	7135.	7480.	7791.
8044.	8331.	8502.	8570.	8807.	8920.	9016.	9093.	9170.	9233.
9263.	9270.	9263.	9246.	9223.	9194.	9158.	9116.	9067.	9011.
8950.	8885.	8811.	8734.	8653.	8568.	8481.	8392.	8301.	8208.
8115.	8021.	7926.	7832.	7737.	7643.	7549.	7456.	7363.	7271.
7179.	7087.	6996.	6908.	6821.	6736.	6657.	6580.	6505.	6432.
6361.	6293.	6227.	6168.	6116.	6064.	6012.	5961.	5910.	5860.
5810.	5761.	5720.	5679.	5639.	5598.	5558.	5519.	5479.	5440.
5401.	5359.	5318.	5278.	5239.	5200.	5162.	5123.	5085.	5036.
4912.	4894.	4891.	4581.	4474.	4369.	4266.	4197.	4153.	4111.
4069.	4021.	3977.	3935.	3896.	3858.	3819.	3782.	3744.	3707.
3671.	3645.	3592.	3563.	3528.	3493.	3459.	3424.	3391.	3357.

STORAGE

17015.	17518.	17422.	17325.	17228.	17139.	17061.	17059.	17169.	17363.
17665.	18421.	18796.	19044.	19237.	19472.	19776.	20126.	20507.	20915.
21339.	21731.	22103.	22456.	22773.	23149.	23614.	24089.	24563.	25042.
25537.	26486.	28137.	30293.	34084.	38408.	41573.	44027.	46126.	48460.
51143.	54053.	57103.	60144.	63047.	65789.	68337.	70654.	72717.	74520.
76172.	77392.	78499.	79415.	80157.	80767.	81277.	81668.	82095.	82429.
82567.	82620.	82565.	82497.	82376.	82222.	82033.	81809.	81546.	81254.
80926.	80566.	80178.	79762.	79323.	78863.	78386.	77894.	77391.	76878.
76355.	75820.	75291.	74751.	74209.	73664.	73118.	72571.	72023.	71473.
70919.	70363.	69809.	69258.	68713.	68174.	67639.	67111.	66587.	66068.
65555.	65047.	64544.	64045.	63551.	63061.	62574.	62091.	61613.	61138.
60667.	60200.	59736.	59276.	56818.	58363.	57911.	57463.	57017.	56575.
56137.	55702.	55271.	54843.	54419.	53997.	53579.	53163.	52751.	52342.
51936.	51534.	51142.	50758.	50384.	50019.	49662.	49312.	48967.	48626.
48288.	47954.	47623.	47297.	46973.	46653.	46335.	46021.	45710.	45402.
45097.	44796.	44497.	44201.	43908.	43618.	43330.	43046.	42764.	42486.

STAGE

710.7	710.7	710.7	710.7	710.6	710.6	710.6	710.6	710.6	710.7
710.7	710.8	710.9	710.9	710.9	710.9	711.0	711.0	711.1	711.1
711.2	711.3	711.3	711.4	711.4	711.5	711.5	711.6	711.7	711.8
711.8	712.0	712.2	712.5	713.0	713.6	714.1	714.4	714.7	715.0
715.3	715.7	716.1	716.5	716.9	717.2	717.5	717.8	718.1	718.3

719.5	719.6	719.6	719.9	719.0	719.1	719.1	719.2	719.2	719.3
719.3	719.3	719.3	719.3	719.3	719.2	719.2	719.2	719.2	719.1
719.1	719.0	719.0	718.9	718.9	718.8	718.8	718.7	718.6	718.6
718.5	718.4	718.4	718.3	718.2	718.2	718.1	718.0	718.0	717.9
717.8	717.8	717.7	717.6	717.6	717.5	717.4	717.4	717.3	717.2
717.2	717.1	717.0	717.0	716.9	716.9	716.8	716.7	716.7	716.6
716.6	716.5	716.4	716.4	716.3	716.3	716.2	716.2	716.1	716.0
716.0	715.9	715.9	715.8	715.8	715.7	715.7	715.6	715.5	715.5
715.4	715.4	715.3	715.3	715.2	715.2	715.1	715.1	715.0	715.0
715.0	714.9	714.9	714.8	714.8	714.7	714.7	714.7	714.6	714.6
714.5	714.5	714.5	714.4	714.4	714.3	714.3	714.3	714.2	714.2

PEAK OUTFLOW IS 9270. AT TIME 62.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	9270.	9246.	6992.	7601.	827879.
CMS	263.	262.	255.	215.	23443.
INCHES		0.42	1.62	4.10	6.20
MM		10.55	41.06	104.11	157.50
AC-FT		4585.	17836.	45229.	68420.
THOUS CU M		5655.	22000.	55789.	84394.

STATION 1, PLAN 1, RATIO 2

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

1287.	1287.	1287.	1287.	1287.	1287.	1287.	1287.	1287.	1287.
1292.	1308.	1319.	1327.	1332.	1340.	1348.	1369.	1394.	1420.
1447.	1472.	1497.	1519.	1539.	1564.	1593.	1624.	1654.	1685.
1717.	1778.	1921.	2108.	2465.	2947.	3319.	3620.	3878.	4183.
4913.	5284.	5569.	5860.	6174.	6551.	6948.	7338.	7697.	8019.
8361.	8545.	8754.	8925.	9066.	9183.	9280.	9359.	9438.	9502.
9532.	9549.	9529.	9511.	9466.	9455.	9417.	9373.	9321.	9263.
9199.	9128.	9053.	8972.	8888.	8800.	8709.	8616.	8521.	8425.
8323.	8230.	8131.	8033.	7934.	7836.	7738.	7641.	7545.	7449.
7353.	7257.	7163.	7070.	6980.	6891.	6804.	6720.	6641.	6565.
6499.	6417.	6347.	6279.	6213.	6157.	6104.	6053.	6001.	5950.
5899.	5849.	5799.	5752.	5711.	5670.	5630.	5589.	5550.	5510.
5471.	5432.	5392.	5350.	5309.	5270.	5231.	5192.	5153.	5115.
5077.	5037.	4999.	4775.	4663.	4553.	4447.	4342.	4240.	4186.
4142.	4099.	4054.	4010.	3965.	3925.	3886.	3848.	3810.	3772.
3735.	3698.	3661.	3625.	3590.	3554.	3519.	3484.	3450.	3416.

STORAGE

17515.	17519.	17422.	17326.	17229.	17141.	17063.	17063.	17170.	17378.
17572.	18463.	18849.	19104.	19304.	19551.	19864.	20224.	20615.	21033.
21469.	21871.	22258.	22615.	22941.	23327.	23804.	24292.	24777.	25269.
25775.	26748.	28436.	30641.	34515.	38933.	42167.	44675.	46819.	49204.
51929.	54909.	58054.	61138.	64105.	66908.	69508.	71872.	73976.	75813.
77394.	78737.	79863.	80793.	81546.	82164.	82679.	83094.	83504.	83840.
83995.	84030.	83902.	83867.	83757.	83595.	83397.	83163.	82893.	82587.
82247.	81876.	81474.	81045.	80593.	80119.	79628.	79122.	78605.	78077.
77541.	76997.	76447.	75893.	75336.	74777.	74217.	73656.	73094.	72531.
71983.	71403.	70825.	70262.	69704.	69152.	68606.	68066.	67531.	67002.
66478.	65960.	65447.	64939.	64437.	63939.	63445.	62955.	62469.	61987.
61509.	61035.	60564.	60097.	59634.	59173.	58716.	58262.	57811.	57363.
56919.	56478.	56040.	55607.	55177.	54750.	54326.	53905.	53488.	53073.
52661.	52241.	51832.	51432.	51043.	50662.	50290.	49927.	49572.	49224.
48883.	48539.	48202.	47869.	47540.	47214.	46891.	46571.	46255.	45941.
45631.	45324.	45020.	44719.	44421.	44126.	43833.	43544.	43257.	42974.

STAGE

710.7	710.7	710.7	710.7	710.6	710.6	710.6	710.6	710.6	710.7
710.7	710.8	710.9	710.9	710.9	711.0	711.0	711.0	711.1	711.2

711.2	711.3	711.3	711.4	711.4	711.5	711.6	711.6	711.7	711.8
711.9	712.0	712.2	712.6	713.1	713.7	714.2	714.5	714.8	715.1
715.4	715.8	716.2	716.6	717.0	717.3	717.7	718.0	718.2	718.4
718.6	718.8	718.9	719.1	719.2	719.2	719.3	719.4	719.4	719.4
719.5	719.5	719.5	719.4	719.4	719.4	719.4	719.4	719.3	719.3
719.2	719.2	719.1	719.1	719.0	719.0	718.9	718.9	718.8	718.7
718.7	718.6	718.5	718.5	718.4	718.3	718.2	718.2	718.1	718.0
718.0	717.9	717.8	717.8	717.7	717.6	717.5	717.5	717.4	717.3
717.3	717.2	717.2	717.1	717.0	717.0	716.9	716.8	716.8	716.7
716.7	716.6	716.5	716.5	716.4	716.4	716.3	716.3	716.2	716.1
716.1	716.0	716.0	715.9	715.9	715.8	715.8	715.7	715.6	715.6
715.5	715.5	715.4	715.4	715.3	715.3	715.2	715.2	715.1	715.1
715.0	715.0	714.9	714.9	714.9	714.8	714.8	714.7	714.7	714.7
714.6	714.6	714.5	714.5	714.5	714.4	714.4	714.3	714.3	714.3

PEAK OUTFLOW IS 9539. AT TIME 62.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	9539.	9513.	9248.	7791.	846560.
CMS	270.	269.	262.	221.	23972.
INCHES		0.43	1.66	4.20	6.34
MM		10.86	42.22	106.71	161.05
AC-FT		4717.	18343.	46358.	69964.
THOUS CU M		5818.	22626.	57182.	86299.

STATION 1, PLAN 1, RATIO 3

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

1287.	1287.	1287.	1287.	1287.	1287.	1287.	1287.	1287.	1287.
1294.	1312.	1324.	1332.	1338.	1346.	1363.	1387.	1413.	1442.
1479.	1490.	1524.	1548.	1570.	1597.	1629.	1662.	1694.	1727.
1761.	1844.	1997.	2196.	2595.	3122.	3532.	3652.	4144.	4769.
5220.	5520.	5425.	6175.	6603.	7068.	7529.	7969.	8362.	8717.
9027.	9294.	9519.	9707.	9859.	9984.	10087.	10171.	10253.	10321.
10351.	10354.	10341.	10317.	10287.	10249.	10205.	10153.	10093.	10026.
9953.	9873.	9787.	9697.	9601.	9502.	9400.	9295.	9189.	9081.
8972.	8861.	8752.	8642.	8532.	8422.	8313.	8205.	8097.	7989.
7882.	7775.	7670.	7566.	7464.	7364.	7266.	7170.	7077.	6985.
6895.	6807.	6723.	6644.	6567.	6492.	6419.	6348.	6280.	6214.
6153.	6105.	6053.	6002.	5950.	5900.	5849.	5799.	5752.	5711.
5670.	5630.	5590.	5550.	5510.	5471.	5432.	5392.	5350.	5309.
5270.	5230.	5190.	5151.	5112.	5073.	4995.	4878.	4764.	4652.
4543.	4436.	4332.	4230.	4181.	4134.	4095.	4050.	4005.	3961.
3921.	3882.	3844.	3806.	3768.	3731.	3694.	3658.	3622.	3586.

STORAGE

17514.	17520.	17424.	17328.	17232.	17145.	17069.	17076.	17205.	17425.
17955.	18591.	19007.	19291.	19509.	19779.	20118.	20507.	20929.	21379.
21844.	22282.	22699.	23085.	23437.	23853.	24366.	24890.	25412.	25940.
26455.	27524.	29324.	31473.	35799.	40500.	43941.	46608.	48869.	51412.
54297.	57472.	60805.	64113.	67271.	70247.	73004.	75507.	77731.	79671.
81337.	82749.	83939.	84902.	85685.	86325.	86855.	87278.	87697.	88037.
88174.	88204.	88136.	88019.	87865.	87676.	87450.	87186.	86883.	86543.
86165.	85759.	85319.	84850.	84356.	83841.	83307.	82757.	82196.	81626.
81045.	80457.	79863.	79268.	78665.	78064.	77461.	76858.	76254.	75649.
75049.	74429.	73821.	73217.	72621.	72030.	71447.	70870.	70300.	69736.
69177.	68629.	68086.	67548.	67017.	66491.	65971.	65457.	64948.	64444.
63945.	63451.	62960.	62473.	61990.	61510.	61035.	60564.	60096.	59633.
59172.	58715.	58262.	57812.	57365.	56921.	56480.	56043.	55610.	55181.
54750.	54316.	53886.	53460.	53036.	52615.	52200.	51792.	51393.	51004.
50624.	50253.	49891.	49537.	49190.	48846.	48506.	48169.	47836.	47507.
47182.	46859.	46540.	46224.	45911.	45601.	45294.	44990.	44689.	44391.

STAGE

710.7	710.7	710.7	710.7	710.6	710.6	710.6	710.6	710.6	710.7
710.8	710.8	710.9	710.9	710.9	711.0	711.0	711.1	711.1	711.2
711.3	711.3	711.4	711.5	711.5	711.6	711.7	711.7	711.8	711.9
712.0	712.1	712.4	712.7	713.3	713.9	714.4	714.7	715.0	715.4
715.7	715.2	716.0	717.0	717.4	717.7	718.1	718.4	718.7	718.9
719.1	719.3	719.5	719.6	719.7	719.8	719.8	719.9	719.9	720.0
720.0	720.0	720.0	720.0	719.9	719.9	719.9	719.9	719.8	719.8
719.7	719.7	719.6	719.6	719.5	719.4	719.4	719.3	719.2	719.2
719.1	719.0	718.9	718.9	718.8	718.7	718.6	718.6	718.5	718.4
718.3	718.3	718.2	718.1	718.0	718.0	717.9	717.8	717.8	717.7
717.6	717.5	717.5	717.4	717.3	717.3	717.2	717.2	717.1	717.0
717.0	716.9	716.9	716.8	716.7	716.7	716.6	716.5	716.5	716.4
716.4	716.3	716.3	716.2	716.1	716.1	716.0	716.0	715.9	715.9
715.8	715.8	715.7	715.6	715.6	715.5	715.5	715.4	715.4	715.3
715.3	715.2	715.2	715.1	715.1	715.0	715.0	714.9	714.9	714.9
714.8	714.8	714.7	714.7	714.6	714.6	714.6	714.5	714.5	714.4

PEAK OUTFLOW IS 10354. AT TIME 62.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	10354.	10325.	10026.	8375.	903059.
CMS	293.	292.	284.	237.	25572.
INCHES		0.46	1.80	4.52	6.76
MM		11.79	45.78	114.71	171.80
AC-FT		5120.	19887.	49834.	74633.
THOUS CU M		6315.	24530.	61470.	92058.

STATION 1, PLAN 1, RATIO 4

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

1287.	1287.	1287.	1287.	1287.	1287.	1287.	1287.	1287.	1301.
1334.	1401.	1460.	1501.	1535.	1575.	1623.	1678.	1736.	1806.
1891.	1973.	2051.	2123.	2190.	2267.	2375.	2487.	2600.	2726.
2884.	3093.	3525.	4109.	5466.	6456.	7546.	8481.	9317.	10283.
11434.	12743.	14155.	15538.	16979.	18310.	19555.	20692.	21702.	22576.
23317.	23931.	24423.	24819.	25111.	25330.	25493.	25601.	25707.	25774.
25741.	25543.	25501.	25336.	25154.	24956.	24745.	24515.	24269.	24007.
23730.	23440.	23138.	22824.	22502.	22173.	21839.	21502.	21162.	20822.
20481.	20141.	19802.	19465.	19130.	18799.	18472.	18148.	17827.	17510.
17194.	16882.	16574.	16271.	15976.	15686.	15403.	15127.	14856.	14591.
14333.	14080.	13833.	13591.	13355.	13124.	12899.	12678.	12463.	12252.
12046.	11845.	11643.	11455.	11267.	11082.	10902.	10726.	10553.	10385.
10223.	10059.	9902.	9748.	9597.	9450.	9306.	9165.	9027.	8892.
8757.	8626.	8497.	8370.	8246.	8125.	8006.	7891.	7777.	7667.
7557.	7453.	7349.	7248.	7150.	7053.	6959.	6867.	6778.	6693.
6613.	6535.	6459.	6385.	6313.	6245.	6181.	6127.	6074.	6021.

STORAGE

17526.	17540.	17554.	17568.	17202.	17213.	17168.	17287.	17651.	18199.
19366.	20739.	21071.	22335.	22876.	23509.	24279.	25147.	26080.	27070.
28077.	29050.	29967.	30920.	31604.	32514.	33614.	34734.	35845.	36965.
38112.	40243.	43894.	48617.	56865.	66249.	73103.	78385.	82872.	87845.
93546.	99783.	106275.	112655.	118681.	124304.	129460.	134082.	138128.	141589.
144491.	146977.	148796.	150294.	151414.	152249.	152868.	153278.	153682.	153935.
153810.	153433.	152399.	152270.	151579.	150828.	150012.	149131.	148183.	147171.
146099.	144970.	143799.	142562.	141298.	139999.	138675.	137331.	135973.	134607.
133231.	131850.	130463.	129088.	127712.	126342.	124980.	123626.	122278.	120937.
119607.	118261.	116930.	115634.	114350.	113087.	111844.	110622.	109420.	108238.
107076.	105934.	104812.	103708.	102624.	101557.	100509.	99479.	98465.	97469.
96490.	95527.	94579.	93647.	92730.	91827.	90939.	90065.	89206.	88360.
87529.	86711.	85906.	85114.	84335.	83568.	82813.	82069.	81338.	80617.
79908.	79179.	78472.	77775.	77088.	76412.	75745.	75088.	74441.	73803.

71174.	72353.	71942.	71338.	70743.	70157.	69577.	69006.	68442.	67886.
67336.	66793.	66256.	65725.	65200.	64681.	64168.	63659.	63155.	62655.

STAGE

710.7	710.7	710.7	710.7	710.7	710.6	710.6	710.7	710.7	710.8
710.9	711.1	711.3	711.4	711.4	711.5	711.6	711.8	711.9	712.0
712.2	712.3	712.5	712.6	712.7	712.8	713.0	713.1	713.3	713.4
713.6	713.9	714.4	715.0	716.1	717.3	718.1	718.8	719.3	719.9
720.7	721.4	722.2	723.0	723.8	724.5	725.1	725.7	726.2	726.6
727.0	727.3	727.5	727.7	727.9	728.0	728.0	728.1	728.2	728.2
728.2	728.1	728.1	728.0	727.9	727.8	727.7	727.6	727.5	727.3
727.2	727.1	726.9	726.8	726.6	726.4	726.3	726.1	725.9	725.8
725.6	725.4	725.3	725.1	724.9	724.7	724.6	724.4	724.2	724.1
723.9	723.7	723.6	723.4	723.2	723.1	722.9	722.8	722.6	722.5
722.3	722.2	722.1	721.9	721.8	721.7	721.5	721.4	721.3	721.1
721.0	720.9	720.8	720.7	720.6	720.4	720.3	720.2	720.1	720.0
719.9	719.8	719.7	719.6	719.5	719.4	719.3	719.2	719.1	719.0
718.8	718.9	718.8	718.7	718.6	718.5	718.4	718.4	718.3	718.2
718.1	718.0	718.0	717.9	717.8	717.7	717.7	717.6	717.5	717.5
717.4	717.4	717.3	717.2	717.1	717.1	717.0	716.9	716.9	716.8

PEAK OUTFLOW IS 25774. AT TIME 60.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	25774.	25640.	24683.	19461.	1909190.
CMS	730.	727.	699.	551.	54062.
INCHES		1.15	4.44	10.49	14.30
MM		29.29	112.79	266.56	363.21
AC-FT		12724.	48958.	115801.	157784.
THOUS CU M		15695.	60389.	142838.	194624.

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

ROUTED HYDROGRAPH AT HILL ST DAM - NO BREACH OUTLET GATE CLOSED-2 GATES OPEN

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
2	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.	0.	0.	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.	0.	0.	-697.	-1

STAGE	690.00	695.92	696.00	696.50	696.60	697.00	697.29	701.00	702.00	702.06
FLOW	0.00	872.00	884.00	973.00	990.00	1160.00	1351.00	7156.00	9323.00	9460.00

CAPACITY=	21.	53.	114.	137.	185.	254.	255.
ELEVATION=	685.	690.	695.	697.	699.	702.	702.

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
696.6	0.	0.	0.	0.	0.	0.	0.

DAM DATA

TOPEL	COQD	EXPD	DAMWID
702.1	3.1	1.5	307.

STATION 2, PLAN 1, RATIO 1

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

1242.	1267.	1257.	1287.	1287.	1287.	1287.	1287.	1287.	1287.
1289.	1299.	1315.	1321.	1327.	1334.	1341.	1359.	1384.	1408.
1435.	1460.	1484.	1500.	1526.	1546.	1577.	1607.	1636.	1666.
1697.	1750.	1870.	2040.	2350.	2812.	3202.	3496.	3759.	4037.
4556.	5133.	5442.	5704.	6006.	6333.	6693.	7069.	7442.	7750.
8033.	8271.	8473.	8649.	8791.	8907.	9004.	9084.	9160.	9226.
9257.	9271.	9265.	9249.	9227.	9199.	9165.	9123.	9075.	9021.
8957.	8893.	8829.	8744.	8663.	8572.	8492.	8403.	8314.	8221.
8122.	8033.	7949.	7844.	7749.	7655.	7561.	7468.	7375.	7282.
7192.	7103.	7013.	6923.	6836.	6751.	6671.	6594.	6518.	6445.
6374.	6302.	6239.	6179.	6125.	6073.	6021.	5970.	5919.	5869.
5819.	5770.	5727.	5687.	5646.	5606.	5566.	5526.	5486.	5447.
5407.	5367.	5325.	5285.	5246.	5207.	5168.	5130.	5092.	5046.
4945.	4822.	4712.	4600.	4493.	4387.	4284.	4206.	4160.	4119.
4074.	4027.	3983.	3941.	3902.	3864.	3825.	3788.	3750.	3713.
3674.	3640.	3604.	3569.	3533.	3498.	3464.	3430.	3396.	3362.

STORAGE

149.	149.	149.	149.	149.	149.	149.	149.	149.	149.
149.	149.	150.	150.	150.	150.	150.	151.	151.	152.
152.	152.	152.	153.	153.	153.	154.	154.	154.	155.
155.	156.	157.	160.	164.	169.	174.	178.	182.	185.
193.	201.	205.	210.	214.	219.	224.	230.	234.	237.
243.	243.	245.	247.	248.	250.	251.	251.	252.	253.
253.	253.	253.	253.	253.	253.	252.	252.	251.	251.
251.	249.	249.	248.	247.	246.	245.	244.	243.	242.
241.	240.	239.	238.	237.	236.	235.	234.	233.	232.
231.	230.	229.	227.	226.	225.	224.	223.	222.	221.
220.	219.	218.	217.	216.	215.	214.	214.	213.	212.
211.	211.	210.	209.	209.	208.	208.	207.	206.	206.
205.	205.	204.	204.	203.	202.	202.	201.	201.	200.
199.	197.	195.	193.	192.	190.	189.	188.	187.	186.
186.	185.	184.	184.	183.	183.	182.	182.	181.	181.
181.	180.	180.	179.	179.	178.	178.	177.	177.	177.

STAGE

697.2	697.2	697.2	697.2	697.2	697.2	697.2	697.2	697.2	697.2
697.2	697.2	697.2	697.2	697.3	697.3	697.3	697.3	697.3	697.3
697.4	697.4	697.4	697.4	697.4	697.4	697.4	697.5	697.5	697.5
697.5	697.5	697.6	697.7	697.9	698.2	698.5	698.7	698.8	699.0
699.3	699.7	699.9	700.1	700.3	700.5	700.7	700.9	701.1	701.3
701.4	701.5	701.6	701.7	701.8	701.8	701.9	701.9	701.9	702.0
702.0	702.0	702.0	702.0	702.0	701.9	701.9	701.9	701.9	701.9
701.9	701.8	701.8	701.7	701.7	701.7	701.6	701.6	701.5	701.5
701.4	701.4	701.4	701.3	701.3	701.2	701.2	701.1	701.1	701.1
701.0	701.0	700.9	700.9	700.8	700.7	700.7	700.6	700.6	700.5
700.5	700.5	700.4	700.4	700.3	700.3	700.3	700.2	700.2	700.2
700.1	700.1	700.1	700.1	700.0	700.0	700.0	700.0	699.9	699.9
699.9	699.9	699.8	699.8	699.8	699.8	699.7	699.7	699.7	699.7
699.6	699.5	699.4	699.4	699.3	699.2	699.2	699.1	699.1	699.1
699.0	699.0	699.0	698.9	698.9	698.9	698.9	698.8	698.8	698.8
698.8	698.8	698.7	698.7	698.7	698.7	698.6	698.6	698.6	698.6

PEAK OUTFLOW IS 9271. AT TIME 62.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	9271.	9247.	8992.	7601.	827549.
CMS	263.	262.	255.	215.	23434.
INCHES		0.42	1.62	4.10	6.20
MM		10.56	41.06	104.12	157.43
AC-FT		4585.	17836.	45231.	68393.
THOUS CU M		5656.	22000.	55792.	84361.

STATION 2, PLAN 1, RATIO 2

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

1282.	1287.	1287.	1287.	1287.	1287.	1287.	1287.	1287.	1287.
1289.	1299.	1316.	1323.	1329.	1330.	1343.	1365.	1390.	1415.
1443.	1468.	1493.	1516.	1536.	1560.	1589.	1619.	1650.	1680.
1712.	1756.	1794.	2074.	2336.	2869.	3272.	3574.	3841.	4127.
4[illegible].	5287.	5503.	5815.	6113.	6481.	6777.	7278.	7658.	7975.
8[illegible].	8514.	8723.	8904.	9050.	9160.	9269.	9350.	9428.	9496.
9527.	9539.	9531.	9514.	9490.	9460.	9424.	9380.	9330.	9270.
9206.	9137.	9063.	8983.	8899.	8811.	8721.	8628.	8533.	8437.
8340.	8244.	8144.	8046.	7947.	7849.	7751.	7654.	7557.	7461.
7365.	7270.	7175.	7082.	6995.	6907.	6819.	6735.	6655.	6578.
6503.	6430.	6359.	6291.	6225.	6167.	6114.	6062.	6010.	5959.
5909.	5858.	5803.	5760.	5718.	5678.	5637.	5597.	5557.	5517.
5477.	5439.	5399.	5357.	5316.	5277.	5238.	5199.	5160.	5122.
5084.	5022.	4913.	4794.	4683.	4572.	4466.	4361.	4258.	4191.
4151.	4196.	4062.	4017.	3972.	3931.	3892.	3854.	3816.	3778.
3741.	3704.	3667.	3631.	3595.	3560.	3524.	3490.	3455.	3421.

STORAGE

149.	149.	149.	149.	149.	149.	149.	149.	149.	149.
149.	149.	150.	150.	150.	150.	151.	151.	151.	152.
152.	152.	153.	153.	153.	153.	154.	154.	155.	155.
155.	156.	158.	160.	164.	170.	175.	179.	183.	186.
189.	203.	207.	211.	216.	221.	227.	232.	236.	240.
243.	245.	248.	250.	251.	252.	253.	254.	255.	256.
256.	256.	256.	256.	256.	255.	255.	255.	254.	253.
253.	252.	251.	250.	250.	249.	248.	247.	246.	245.
244.	243.	241.	240.	239.	238.	237.	236.	235.	234.
233.	232.	231.	230.	229.	227.	226.	225.	224.	223.
221.	220.	219.	218.	217	216.	216.	215.	214.	213.
213.	212.	211.	210.	210.	209.	209.	208.	207.	207.
206.	206.	205.	205.	204.	203.	203.	202.	202.	201.
201.	200.	199.	198.	195.	193.	191.	190.	188.	187.
187.	186.	186.	185.	184.	184.	183.	183.	182.	182.
181.	181.	180.	180.	179.	179.	179.	178.	178.	177.

STAGE

697.2	697.2	697.2	697.2	697.2	697.2	697.2	697.2	697.2	697.2
697.2	697.2	697.2	697.2	697.3	697.3	697.3	697.3	697.3	697.3
697.3	697.4	697.4	697.4	697.4	697.4	697.4	697.5	697.5	697.5
697.5	697.5	697.6	697.8	698.0	698.3	698.5	698.7	698.9	699.1
699.3	699.3	699.9	700.1	700.3	700.5	700.8	701.1	701.2	701.4
701.5	701.6	701.7	701.8	701.9	701.9	702.0	702.0	702.0	702.1
702.1	702.1	702.1	702.1	702.1	702.1	702.0	702.0	702.0	702.0
701.9	701.9	701.9	701.8	701.8	701.8	701.7	701.7	701.6	701.6
701.5	701.5	701.5	701.4	701.4	701.3	701.3	701.2	701.2	701.1
701.1	701.1	701.1	701.0	700.9	700.8	700.8	700.7	700.7	700.6
700.6	700.5	700.5	700.4	700.4	700.4	700.3	700.3	700.3	700.2
700.2	700.2	700.1	700.1	700.1	700.1	700.0	700.0	700.0	700.0
699.9	699.9	699.9	699.9	699.8	699.8	699.8	699.7	699.7	699.7
699.7	699.6	699.6	699.5	699.4	699.3	699.3	699.2	699.1	699.1
699.1	699.1	699.0	699.0	699.0	698.9	698.9	698.9	698.9	698.8
698.8	698.8	698.8	698.7	698.7	698.7	698.7	698.7	698.6	698.6

PEAK OUTFLOW IS 9539. AT TIME 62.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	9539.	9513.	9248.	7791.	846219.
CMS	270.	269.	262.	221.	23962.
INCHES		0.43	1.66	4.20	5.34
MM		10.86	42.23	106.72	160.99
AC-FT		4717.	18344.	46359.	69935.

TOTAL CO M	9819.	22627.	57163.	66264.

STATION 2, PLAN 1, RATIO 3

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

1282.	1287.	1287.	1287.	1287.	1287.	1287.	1287.	1287.	1287.
1293.	1305.	1320.	1328.	1335.	1342.	1358.	1384.	1409.	1437.
1466.	1494.	1529.	1545.	1567.	1592.	1623.	1657.	1689.	1722.
1759.	1827.	1969.	2163.	2514.	3034.	3479.	3804.	4098.	4627.
5179.	5468.	5763.	6110.	6522.	6965.	7471.	7910.	8313.	8673.
9099.	9262.	9494.	9690.	9844.	9973.	10076.	10164.	10244.	10316.
10343.	10354.	10343.	10328.	10290.	10253.	10210.	10158.	10100.	10034.
9951.	9882.	9798.	9709.	9611.	9514.	9412.	9309.	9203.	9095.
8977.	8877.	8767.	8656.	8546.	8437.	8327.	8219.	8112.	8003.
7896.	7789.	7683.	7579.	7477.	7377.	7279.	7183.	7093.	7001.
6911.	6823.	6738.	6658.	6580.	6505.	6432.	6360.	6293.	6226.
6167.	6115.	6063.	6011.	5960.	5909.	5858.	5808.	5760.	5718.
5679.	5637.	5597.	5557.	5517.	5478.	5439.	5399.	5358.	5317.
5277.	5237.	5197.	5156.	5119.	5080.	5012.	4901.	4783.	4672.
4562.	4455.	4359.	4248.	4166.	4147.	4102.	4058.	4012.	3968.
3927.	3888.	3850.	3812.	3774.	3737.	3700.	3664.	3627.	3592.

STORAGE

149.	149.	149.	149.	149.	149.	149.	149.	149.	149.
149.	149.	150.	150.	150.	151.	151.	151.	152.	152.
152.	153.	153.	153.	154.	154.	154.	155.	155.	156.
156.	157.	157.	161.	166.	172.	178.	182.	186.	194.
212.	206.	211.	216.	227.	229.	234.	239.	243.	247.
255.	253.	254.	257.	259.	260.	261.	261.	262.	263.
263.	263.	263.	263.	262.	262.	262.	261.	261.	260.
259.	259.	258.	258.	257.	256.	255.	254.	253.	252.
251.	249.	248.	247.	246.	245.	243.	242.	241.	240.
239.	238.	237.	235.	234.	233.	232.	231.	230.	229.
227.	226.	225.	224.	223.	221.	220.	219.	218.	217.
216.	215.	215.	214.	213.	213.	212.	211.	210.	210.
209.	209.	208.	207.	207.	206.	206.	205.	205.	204.
203.	203.	202.	202.	201.	200.	199.	198.	196.	194.
193.	191.	190.	188.	187.	187.	186.	185.	185.	184.
184.	183.	183.	182.	182.	181.	181.	180.	180.	179.

STAGE

697.2	697.2	697.2	697.2	697.2	697.2	697.2	697.2	697.2	697.2
697.2	697.2	697.2	697.3	697.3	697.3	697.3	697.3	697.3	697.3
697.4	697.4	697.4	697.4	697.4	697.4	697.5	697.5	697.5	697.5
697.5	697.6	697.7	697.8	698.0	698.4	698.7	698.9	699.0	699.4
699.7	699.9	700.1	700.3	700.6	700.9	701.1	701.3	701.5	701.7
701.8	702.0	702.1	702.1	702.2	702.3	702.3	702.3	702.3	702.4
702.4	702.4	702.4	702.4	702.4	702.3	702.3	702.3	702.3	702.3
702.2	702.2	702.2	702.2	702.1	702.1	702.0	702.0	701.9	701.9
701.8	701.8	701.7	701.7	701.6	701.6	701.5	701.5	701.4	701.4
701.3	701.3	701.2	701.2	701.1	701.1	701.1	701.0	701.0	700.9
700.8	700.8	700.7	700.7	700.6	700.6	700.5	700.5	700.4	700.4
700.4	700.3	700.3	700.3	700.2	700.2	700.2	700.1	700.1	700.1
700.1	700.0	700.0	700.0	700.0	699.9	699.9	699.9	699.9	699.8
699.8	699.8	699.7	699.7	699.7	699.7	699.6	699.6	699.5	699.4
699.3	699.3	699.2	699.1	699.1	699.1	699.0	699.0	699.0	699.0
698.9	698.9	698.9	698.9	698.8	698.8	698.8	698.8	698.7	698.7

PEAK OUTFLOW IS 10354. AT TIME 62.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	10354.	10325.	10027.	8375.	902691.
CMS	293.	292.	284.	237.	25561.

INCHES	0.46	1.80	4.52	6.76
MM	11.79	45.78	114.71	171.73
AC-FT	5120.	19888.	49832.	74603.
THOUS CU M	6315.	24531.	61467.	92021.

STATION 2, PLAN 1, RATIO 4

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

1287.	1287.	1287.	1287.	1287.	1287.	1287.	1287.	1287.	1294.
1321.	1353.	1456.	1494.	1531.	1565.	1616.	1669.	1727.	1794.
1872.	1961.	2083.	2113.	2180.	2254.	2356.	2470.	2582.	2706.
2835.	3997.	5447.	6012.	5157.	6344.	7327.	8420.	9183.	10197.
11323.	12665.	14046.	15594.	16887.	18230.	19480.	20628.	21644.	22530.
23277.	23930.	24432.	24799.	25097.	25320.	25485.	25590.	25700.	25773.
25745.	25597.	25310.	25345.	25165.	24969.	24758.	24529.	24284.	24023.
23747.	23457.	23155.	22843.	22521.	22193.	21859.	21522.	21183.	20843.
20502.	20162.	19823.	19486.	19151.	18820.	18493.	18169.	17848.	17531.
17219.	16912.	16609.	16292.	15996.	15700.	15423.	15146.	14875.	14610.
14351.	14098.	13851.	13609.	13373.	13142.	12916.	12696.	12480.	12269.
12063.	11862.	11664.	11472.	11283.	11099.	10919.	10742.	10568.	10401.
10235.	10075.	9917.	9763.	9613.	9467.	9324.	9183.	9045.	8910.
8776.	8643.	8513.	8386.	8262.	8140.	8023.	7905.	7792.	7681.
7572.	7466.	7362.	7261.	7162.	7072.	6975.	6884.	6793.	6708.
6627.	6548.	6472.	6398.	6326.	6258.	6192.	6137.	6084.	6030.

STORAGE

149.	149.	149.	149.	149.	149.	149.	149.	149.	149.
150.	151.	152.	153.	153.	154.	154.	155.	156.	156.
158.	159.	160.	161.	161.	162.	164.	165.	167.	168.
170.	172.	174.	195.	202.	219.	233.	244.	253.	262.
270.	278.	287.	295.	303.	310.	317.	322.	327.	332.
339.	333.	341.	342.	344.	345.	346.	346.	347.	347.
347.	346.	345.	345.	344.	343.	342.	341.	340.	339.
337.	336.	335.	333.	332.	330.	328.	327.	325.	323.
322.	320.	318.	317.	315.	313.	312.	310.	308.	306.
305.	303.	301.	300.	298.	297.	295.	293.	292.	290.
289.	287.	286.	284.	283.	282.	280.	279.	277.	276.
275.	273.	272.	271.	269.	268.	267.	266.	264.	263.
262.	261.	259.	258.	257.	255.	254.	253.	251.	250.
249.	247.	246.	244.	243.	241.	240.	239.	238.	237.
235.	234.	233.	232.	231.	230.	228.	227.	226.	224.
223.	222.	221.	220.	219.	218.	217.	216.	215.	214.

STAGE

697.2	697.2	697.2	697.2	697.2	697.2	697.2	697.2	697.2	697.2
697.2	697.3	697.4	697.4	697.4	697.4	697.5	697.5	697.5	697.6
697.6	697.7	697.7	697.8	697.8	697.9	697.9	698.0	698.1	698.2
698.2	698.4	698.6	699.0	699.7	700.5	701.1	701.6	701.9	702.3
702.7	703.0	703.4	703.8	704.1	704.4	704.7	704.9	705.1	705.3
705.5	705.6	705.7	705.8	705.8	705.9	705.9	705.9	706.0	706.0
706.0	706.0	705.9	705.9	705.9	705.8	705.8	705.7	705.7	705.6
705.6	705.5	705.5	705.4	705.3	705.3	705.2	705.1	705.0	705.0
704.9	704.8	704.7	704.7	704.6	704.5	704.5	704.4	704.3	704.2
704.2	704.1	704.0	704.0	703.9	703.8	703.8	703.7	703.6	703.6
703.5	703.4	703.4	703.3	703.2	703.2	703.1	703.1	703.0	702.9
702.9	702.8	702.8	702.7	702.7	702.6	702.6	702.5	702.4	702.4
702.3	702.3	702.2	702.2	702.1	702.1	702.0	701.9	701.9	701.8
701.7	701.7	701.6	701.6	701.5	701.5	701.4	701.3	701.3	701.2
701.2	701.1	701.1	701.0	701.0	700.9	700.9	700.8	700.8	700.7
700.7	700.6	700.6	700.5	700.5	700.4	700.4	700.3	700.3	700.3

PEAK OUTFLOW IS 25773. AT TIME 60.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	25773.	25660.	24682.	19461.	1908419.
CMS	730.	727.	699.	551.	54040.
INCHES		1.15	4.44	10.49	14.29
MM		29.29	112.69	266.56	363.06
AC-FT		12724.	48956.	115800.	157721.
THOUS CU M		15695.	60387.	142837.	194545.

********** ********** ********** ********** **********

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FORMULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIO 1 0.92	RATIO 2 0.94	RATIO 3 1.00	RATIO 4 2.00	
				RATIOS APPLIED TO FLOWS				
HYD-GRAPH AT	1	207.00 (0.23E 13)	1	65029. (1841.42)(	66443. 1881.46)(	70684. 2001.55)(	141368. 4003.10)(	
ROUTED TO	1	207.00 (0.23E 13)	1	9270. (262.51)(	9539. 270.10)(	10354. 293.19)(	25774. 729.84)(	(OWASCO LAKE OUTLET DAM
ROUTED TO	2	207.00 (0.42E 13)	1	9271. (262.51)(	9539. 270.11)(	10354. 293.20)(	25773. 729.81)(	(MILL ST. DAM
						½ PMF	PMF	

SUMMARY OF DAM SAFETY ANALYSIS

OWASCO LAKE OUTLET DAM (NY-776)

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	710.72	710.72	717.00
STORAGE	17712.	17712.	64233.
OUTFLOW	1287.	1287.	6188.

	RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
	0.92	719.29	2.29	82626.	9270.	53.00	62.00	0.
	1.24	719.47	2.47	84030.	9539.	60.00	62.00	0.
½ PMF	1.00	719.99	2.99	88204.	10354.	66.00	62.00	0.
PMF	2.00	728.18	11.18	153935.	25774.	121.00	60.00	0.

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

MILL ST. DAM (NY-775)

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	696.50	696.60	702.06
STORAGE	136.	137.	255.
OUTFLOW	973.	990.	9460.

	RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
	0.92	701.93	0.	253.	9271.	0.	62.00	0.
	0.94	702.09	0.03	256.	9539.	7.00	62.00	0.
½ PMF	1.00	702.38	0.32	263.	10354.	24.00	62.00	0.
PMF	2.00	705.94	3.92	347.	25773.	87.00	60.00	0.

```
K1   ROUTED OUTFLOW - ALL GATES FULL OPEN - INFLOW HYDROGRAPH TO MILL ST DAM
Y                                   1       1
Y1   3                                                  -710.72      -1
Y4 710.72     711     712   712.82     713  713.27     714  714.85     715  715.12
Y4 715.5   715.57     716     716.5     717   717.5     718
Y5  1257     1350    1777    2265    2386    2584    3175    3953    4106    4221
Y5  5053     5113    5408    5763    6168    6670    7186
S5  6246    12900   17712   19917   26734   33752   40970   46590   56211   64233
SE  709      710   710.72     711     712     713     714     715     716     717
S$710.72
S0   717    3.027     1.5      70
K      1        2                                          1
K1ROUTED HYDROGRAPH AT MILL ST DAM - NO BREACH   OUTLET & AUTOMATIC GATES CLOSED
Y                                   1       1
Y1     1                                                 -696.5      -1
Y4 695.92     696   696.5   696.6     697  697.29     701     702  702.06
Y5     0       2      33      42     182     349    5864    7951    8084
S5    21      35   113.5     137     185     254   255.4
SE   685     690     695   696.6     699     702  702.06
S$ 695.6
S0 702.06    3.027     1.5     307
K     99
A
A
A
A
A
```

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

MILL ST. DAM

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	696.50	696.60	702.06
STORAGE	136.	137.	255.
OUTFLOW	33.	42.	9084.

	RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
½ PMF	1.00	702.61	0.75	273.	10354.	41.00	62.00	0.
PMF	2.00	705.30	4.24	354.	25773.	99.00	60.00	0.

```
K1 BREAC[illegible] OUTLETS - ALL GATES FULL OPEN - INFLOW HYDROGRAPH TO MILL ST DAM
Y                                   1       1
Y1      3                                                   -710.72      -1
Y4710.72      711      712  712.89      713  713.27      714  714.85      715  715.12
Y4  715.5  715.87      716  716.5      717  717.5      718
Y5   1287     1[illegible]  1777     2265     2[illegible]  2594     3175     3953     4106     4221
Y5   5[illegible]  5313     5468     5753     6168     6579     7186
S5   6236    12960    17712    19917    20734    33752    40970    48590    56211    64233
E8    700      710  710.72      711      712      713      714      715      716      717
E8710.72
S1    717    1.037      1.5       70
S8     14        0      700        1  710.72      724
K       1        2                                                1
K1ROUTED HYDROGRAPH AT MILL ST DAM - NO BREACH   OUTLET + AUTOMATIC GATES CLOSED
Y                                   1       1
Y1      1                                                   -696.5      -1
Y4695.92      695      696.5      696.6      697  697.29      701      702  702.06
Y5      0        2       33       42      182      349     5864     7951     6084
S5     21       55    113.5      137      185      254    255.4
S8    695      697      696      696.6      699      702   702.06
S5 696.[illegible]
S702.06    3.037      1.5      307
E      90
A
A
A
A
A
```

HYDROGRAPH ROUTING

OWASCO LAKE (ASSUMED)
OUTLET DAM

BREACHED OUTLET - ALL GATES FULL OPEN - INFLOW HYDROGRAPH TO MILL ST DAM

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	1	0	0	0	0	1	0	0

ROUTING DATA

NQ	NDMS	CLSS	AVG	IRES	ISAME	IOPT	IPRP	LSTR
	.	..	0.	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSK	X	TSK	STORA	ISPRAT
9	0	0	0. 0.		0.	-711.	-1

STAGE	711.72	711.00	712.00	712.82	713.00	713.27	714.00	714.85	715.00	715.12
	715.50	715.87	716.00	716.50	717.00	717.50	718.00			
FLOW	1267.00	1390.00	1777.00	2465.00	2383.00	2584.00	3175.00	3953.00	4106.00	4221.00
	5055.00	5343.00	5408.00	5763.00	6188.00	6670.00	7186.00			
CAPACITY=	6206.	12900.	17712.	19917.	26734.	33752.	40970.	48590.	56211.	64233.
ELEVATION=	709.	710.	711.	711.	712.	713.	714.	715.	716.	717.

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
710.7	0.	0.	0.	0.	0.	0.	0.

DAM DATA

TOPEL	COQD	EXPD	DAMWID
717.0	3.1	1.5	70.

DAM BREACH DATA

BLWID	Z	ELBR	TFAIL	WSEL	FAILEL
14.	1.	709.00	1.00	710.72	724.00

WARNING *** TOP OF DAM BELOW IF BREACHED OR LOW-LEVEL OUTLET IS NOT WITHIN RANGE OF GIVEN ELEVATIONS IN STORAGE-ELEVATION DATA
BUTTOM OF RESERVOIR ASSUMED TO BE AT 709.00
STORAGE-ELEVATION DATA WILL BE EXTRAPOLATED ABOVE ELEVATION 717.00

STATION 1, PLAN 1, RATIO 1

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

1267.	1267.	1267.	1267.	1287.	1287.	1287.	1287.	1287.	1287.
1287.	1312.	1329.	1332.	1333.	1346.	1363.	1387.	1413.	1442.
1470.	1495.	1529.	1541.	1573.	1597.	1629.	1662.	1694.	1727.
1761.	1844.	1937.	2196.	2595.	3122.	3532.	3952.	4144.	4769.
5625.	5922.	6225.	6175.	6603.	7061.	7529.	7964.	8362.	8717.
9027.	9294.	9519.	9707.	9859.	9984.	10087.	10171.	10253.	10321.
10385.	10395.	10341.	10317.	10287.	10245.	10255.	10153.	10093.	10026.
9953.	9875.	9797.	9727.	9651.	9562.	9406.	9295.	9180.	9081.
8972.	8855.	8752.	8642.	8532.	8422.	8315.	8205.	8097.	7989.
7882.	7775.	7670.	7566.	7464.	7364.	7266.	7170.	7077.	6985.
6895.	6807.	6723.	6644.	6567.	6492.	6419.	6348.	6280.	6214.
6150.	6088.	6053.	6002.	5950.	5900.	5849.	5799.	5752.	5711.
5677.	5638.	5593.	5550.	5510.	5471.	5432.	5392.	5350.	5309.
5267.	5226.	5189.	5151.	5112.	5073.	4995.	4878.	4764.	4652.
4545.	4443.	4332.	4230.	4181.	4133.	4095.	4050.	4005.	3961.
3921.	3882.	3844.	3806.	3768.	3731.	3694.	3654.	3622.	3586.

STORAGE

17061.	17242.	17429.	17326.	17232.	17143.	17069.	17075.	17205.	17425.
17755.	18591.	19487.	19291.	19507.	19777.	20118.	20507.	20929.	21379.
[illegible]	[illegible]	22899.	23135.	23437.	23353.	24[illegible].	24890.	25412.	25940.

[illegible]	[illegible]	[illegible]	[illegible]	39799.	40304.	42541.	[illegible]	48389.	51412.
[illegible]	[illegible]	[illegible]	64115.	67271.	70247.	73004.	75507.	77731.	79671.
[illegible]	[illegible]	[illegible]	[illegible]	85665.	86325.	86755.	87273.	87697.	88037.
[illegible]	[illegible]	85319.	84350.	84356.	83841.	83307.	82757.	82196.	81626.
81045.	80457.	79863.	79266.	78665.	78064.	77461.	76858.	76254.	75649.
[illegible]	[illegible]	73621.	73017.	72621.	72030.	71447.	70870.	70300.	69736.
[illegible]	[illegible]	[illegible]	67548.	67017.	66491.	65971.	65457.	64948.	64444.
[illegible]	[illegible]	[illegible]	62473.	61990.	61510.	61035.	60564.	60096.	59633.
[illegible]	[illegible]	[illegible]	57612.	57165.	56921.	56480.	56043.	55610.	55181.
[illegible]	[illegible]	[illegible]	53330.	52938.	52615.	52290.	51792.	51393.	51004.
[illegible]	[illegible]	46541.	46237.	49190.	48846.	48506.	48169.	47836.	47507.
[illegible]	46857.	46543.	46224.	45911.	45601.	45294.	44990.	44689.	[illegible]

STAGE

[illegible]	719.7	719.7	710.7	719.6	710.6	710.6	710.6	710.6	710.7
[illegible]	[illegible]	719.9	719.9	719.9	711.0	711.0	711.1	711.1	711.2
711.3	711.3	711.4	711.5	711.5	711.6	711.7	711.7	711.8	711.9
712.[illegible]	712.1	712.4	712.7	713.3	713.9	714.4	714.7	715.0	715.4
715.7	716.4	716.6	717.0	717.4	717.7	718.1	718.4	718.7	718.9
719.1	719.[illegible]	719.5	719.6	719.7	719.8	719.8	719.9	719.9	720.0
[illegible]	720.	[illegible]	720.0	719.9	719.9	719.9	719.9	719.9	719.8
719.7	719.7	719.7	719.6	719.5	719.4	719.4	719.3	719.3	719.2
719.1	719.	719.[illegible]	719.9	718.8	718.7	718.[illegible]	718.6	718.5	718.4
717.[illegible]	717.[illegible]	717.2	717.1	718.0	716.9	717.9	717.9	717.8	717.7
717.6	717.[illegible]	717.5	717.4	717.3	717.3	717.2	717.2	717.1	717.0
717.	716.[illegible]	716.[illegible]	716.8	716.7	716.7	716.6	716.5	716.5	716.4
716.4	716.[illegible]	716.3	716.2	716.1	716.1	716.0	716.0	715.9	715.9
715.[illegible]	715.[illegible]	715.7	715.6	715.6	715.5	715.5	715.4	715.4	715.3
715.3	715.4	715.2	715.1	715.1	715.0	715.0	714.9	714.9	714.9
714.[illegible]	714.8	714.7	714.7	714.6	714.6	714.6	714.5	714.5	714.4

PEAK OUTFLOW IS 10354. AT TIME 62.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	10354.	10315.	10026.	8375.	903059.
CMS	293.	292.	284.	237.	25572.
INCHES		0.46	1.60	4.52	6.76
MM		11.79	45.78	114.71	171.80
AC-FT		5120.	19887.	49634.	74633.
THOUSAND CU M		6315.	24530.	61470.	92058.

WARNING *** TOP OF DAM STATION OF BREACH OR LOW-LEVEL OUTLET IS NOT WITHIN RANGE OF GIVEN ELEVATIONS IN STORAGE-ELEVATION DATA
BOTTOM OF RESERVOIR ASSUMED TO BE AT 709.00
STORAGE-ELEVATION DATA WILL BE EXTRAPOLATED ABOVE ELEVATION 717.00

STATION 15 PLAN 15 RATIO 2

BEGIN DAM FAILURE AT 46.00 HOURS

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

1237.	1237.	1237.	1237.	1237.	1237.	1237.	1237.	1237.	1301.
[illegible]	1401.	1463.	1501.	1535.	1575.	1623.	1678.	1736.	1806.
1871.	1972.	2.51.	2123.	2190.	2267.	2375.	2487.	2600.	2726.
[illegible]	[illegible]	[illegible]	4130.	5466.	6455.	7546.	8481.	9317.	10283.
[illegible]	12745.	14155.	15588.	16979.	18326.	24019.	26114.	27156.	28038.
[illegible]	[illegible]	29779.	30087.	30305.	30427.	30488.	30488.	30490.	30448.
[illegible]	30372.	[illegible]	[illegible]	29201.	2838.	28544.	28192.	27826.	27444.
[illegible]	26645.	25327.	[illegible]	25371.	24935.	24496.	24056.	23518.	23182.
[illegible]	22517.	21831.	21150.	21053.	20643.	20240.	19843.	19451.	19066.
[illegible]	[illegible]	17283.	17579.	17227.	16885.	16550.	16225.	15907.	15598.
[illegible]	[illegible]	14714.	14459.	14161.	13910.	13646.	13395.	13151.	12914.

[illegible]	[illegible]	[illegible]	[illegible]	8187.	4087.	8596.	8511.	8426.	8342.
[illegible]	8177.	[illegible]	8106.	7923.	7841.	7760.	7673.	7472.	7277.
[illegible]	[illegible]	[illegible]	6651.	6562.	6472.	6387.	6307.	6227.	6149.

STORAGE

[illegible]	[illegible]	17454.	17339.	17282.	17213.	17168.	17297.	17651.	18199.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	23909.	24273.	25147.	26080.	27070.
[illegible]	[illegible]	29987.	30326.	31604.	32514.	33614.	34734.	35645.	36965.
[illegible]	[illegible]	[illegible]	46617.	56865.	66249.	73103.	78295.	82872.	87845.
[illegible]	[illegible]	109275.	112655.	119581.	124403.	129215.	133395.	136991.	140001.
[illegible]	[illegible]	[illegible]	[illegible]	147611.	[illegible]	[illegible]	148224.	148228.	148091.
[illegible]	[illegible]	[illegible]	[illegible]	142931.	142651.	141717.	140526.	139279.	137970.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	129274.	127725.	126165.	124600.	123035.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	113732.	112271.	110724.	109239.	107757.
[illegible]	[illegible]	[illegible]	[illegible]	100601.	99237.	97897.	96582.	95292.	94025.
[illegible]	91561.	[illegible]	[illegible]	[illegible]	86904.	85792.	84701.	83630.	82578.
[illegible]	[illegible]	79933.	78554.	77590.	76643.	75712.	74796.	73897.	73013.
72143.	[illegible]	[illegible]	[illegible]	69507.	68605.	67216.	66439.	65673.	64917.
[illegible]	[illegible]	[illegible]	61929.	61189.	60467.	59753.	59045.	58346.	57653.
56967.	[illegible]	55617.	54954.	54296.	53646.	53002.	52365.	51739.	51130.
[illegible]	[illegible]	47385.	46841.	47295.	47757.	47225.	46701.	46183.	45672.

STAGE

[illegible]	[illegible]	710.7	[illegible]	710.7	710.6	710.6	710.7	710.7	710.8
[illegible]	711.1	711.3	711.4	711.4	711.5	711.6	711.8	711.9	712.0
[illegible]	[illegible]	712.5	712.6	712.7	712.8	713.0	713.1	713.3	713.4
713.6	713.7	714.4	715.0	716.1	717.3	718.1	718.8	719.3	719.9
[illegible]	[illegible]	722.2	722.0	723.0	724.5	725.3	725.6	726.1	726.4
[illegible]	[illegible]	[illegible]	727.3	727.4	727.4	727.5	727.5	727.5	727.5
727.4	727.3	727.2	727.1	726.9	726.8	726.7	726.5	726.4	726.2
726.0	725.9	725.7	725.5	725.3	725.1	724.9	724.7	724.5	724.3
724.1	723.9	723.7	723.6	723.4	723.2	723.0	722.8	722.6	722.4
722.2	722.1	721.9	721.7	721.5	721.4	721.2	721.0	720.9	720.7
720.6	720.5	720.3	720.1	720.0	719.8	719.7	719.6	719.4	719.3
719.2	719.1	719.0	718.8	718.7	718.5	718.4	718.3	718.2	718.1
718.0	717.9	717.8	717.7	717.6	717.5	717.4	717.3	717.2	717.1
717.0	716.9	716.8	716.7	716.6	716.5	716.4	716.4	716.3	716.2
716.1	716.0	715.9	715.8	715.7	715.7	715.6	715.5	715.4	715.3
715.3	715.2	715.1	715.0	715.0	714.9	714.8	714.8	714.7	714.6

PEAK OUTFLOW IS 30490. AT TIME 54.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	30490.	30440.	29125.	21967.	2114542.
CMS	863.	862.	825.	623.	59877.
INCHES		1.27	5.24	11.86	15.84
MM		34.75	132.98	301.16	402.27
AC-FT		15094.	57769.	130831.	174750.
THOUS CU M		18616.	71257.	161378.	215558.

CUASCO LAKE
OUTLET DAM
(ASSUMED BREACH)

THE DAM BREACH HYDROGRAPH WAS DEVELOPED USING A TIME INTERVAL OF 0.020 HOURS DURING BREACH FORMATION.
DOWNSTREAM CALCULATIONS MADE USE A TIME INTERVAL OF 1.000 HOURS.
THE TABLE COMPARES THE HYDROGRAPH FOR DOWNSTREAM CALCULATIONS WITH THE COMPUTED BREACH HYDROGRAPH.
INTERMEDIATE TIMES ARE INTERPOLATED FROM END-OF-PERIOD VALUES.

TIME (HOURS)	TIME FROM BEGINNING OF BREACH (HOURS)	INTERPOLATED BREACH HYDROGRAPH (CFS)	-	COMPUTED BREACH HYDROGRAPH (CFS)	=	ERROR (CFS)	ACCUMULATED ERROR (CFS)	ACCUMULATED ERROR (AC-FT)
46.000	0.	18329.		18324.		0.	0.	0.
46.020	0.020	18556.		19382.		-826.	-826.	-1.
46.040	0.040	18584.		19372.		-788.	-1610.	-3.
46.060	0.060	18720.		19464.		-744.	-2354.	-4.
46.080	0.080	18852.		19557.		-705.	-3058.	-5.
46.100	0.100	18984.		19651.		-667.	-3725.	-6.
46.120	0.120	19116.		19746.		-630.	-4355.	-7.
46.140	0.140	19248.		19842.		-595.	-4950.	-8.
46.160	0.160	19380.		19940.		-561.	-5511.	-9.
46.180	0.180	19511.		20039.		-528.	-6038.	-10.
46.200	0.200	19643.		20139.		-496.	-6534.	-11.
46.220	0.220	19775.		20240.		-465.	-6999.	-12.
46.240	0.240	19907.		20343.		-436.	-7435.	-12.
46.260	0.260	20039.		20446.		-407.	-7842.	-13.
46.280	0.280	20171.		20551.		-380.	-8221.	-14.
46.300	0.300	20303.		20656.		-353.	-8575.	-14.
46.320	0.320	20435.		20763.		-328.	-8903.	-15.
46.340	0.340	20567.		20870.		-304.	-9206.	-15.
46.360	0.360	20699.		20979.		-281.	-9487.	-16.
46.380	0.380	20830.		21089.		-258.	-9745.	-16.
46.400	0.400	20962.		21199.		-237.	-9982.	-16.
46.420	0.420	21094.		21311.		-217.	-10199.	-17.
46.440	0.440	21226.		21423.		-197.	-10396.	-17.
46.460	0.460	21358.		21537.		-179.	-10575.	-17.
46.480	0.480	21490.		21651.		-161.	-10736.	-18.
46.500	0.500	21622.		21767.		-145.	-10881.	-18.
46.520	0.520	21754.		21883.		-129.	-11011.	-18.
46.540	0.540	21886.		22000.		-114.	-11125.	-18.
46.560	0.560	22017.		22118.		-101.	-11226.	-19.
46.580	0.580	22149.		22237.		-88.	-11313.	-19.
46.600	0.600	22281.		22357.		-76.	-11389.	-19.
46.620	0.620	22413.		22477.		-64.	-11453.	-19.
46.640	0.640	22545.		22599.		-54.	-11507.	-19.
46.660	0.660	22677.		22721.		-44.	-11551.	-19.
46.680	0.680	22809.		22844.		-35.	-11586.	-19.
46.700	0.700	22941.		22968.		-27.	-11614.	-19.
46.720	0.720	23073.		23093.		-20.	-11634.	-19.
46.740	0.740	23204.		23218.		-14.	-11648.	-19.
46.760	0.760	23336.		23345.		-8.	-11656.	-19.
46.780	0.780	23468.		23472.		-4.	-11659.	-19.
46.800	0.800	23600.		23600.		1.	-11659.	-19.
46.820	0.820	23732.		23728.		4.	-11655.	-19.
46.840	0.840	23864.		23856.		5.	-11649.	-19.
46.860	0.860	23996.		23987.		8.	-11641.	-19.
46.880	0.880	24128.		24119.		9.	-11632.	-19.
46.900	0.900	24260.		24250.		9.	-11622.	-19.
46.920	0.920	24391.		24383.		9.	-11613.	-19.
46.940	0.940	24523.		24516.		8.	-11606.	-19.
46.960	0.960	24655.		24649.		6.	-11600.	-19.
46.980	0.980	24787.		24784.		3.	-11597.	-19.
47.000	1.000	24919.		24919.		0.	-11597.	-19.

OWASCO LAKE
OUTLET DAM
(ASSUMED BREACH)

STATION 1

(O) INTERPOLATED BREACH HYDROGRAPH
(B) COMPUTED BREACH HYDROGRAPH
(*) POINTS AT NORMAL TIME INTERVAL

TIME (HR)	0.	1000.	2000.	3000.	4000.	5000.	6000.	7000.	8000.	9000.	0.	0.	0.	0.	0.
46.0	1.	*													
46.2	2.	O	B												
46.4	3.	O	B												
46.6	4.	O	B												
46.8	5.	O	B												
46.0	6.	O	B												
46.2	7.	O	B												
46.4	8.	O	B												
46.6	9.	O	B												
46.8	10.	O													
46.0	11.	O	B												
46.2	12.	O	B												
46.4	13.	O	B												
46.6	14.	O	B												
46.8	15.	O	B												
46.0	16.	O	B												
46.2	17.	O	B												
46.4	18.	O	B												
46.6	19.	O	B												
46.8	20.	O	B												
46.0	21.	O	B												
46.2	22.	O	B												
46.4	23.	O	B												
46.6	24.	O	B												
46.8	25.	O	B												
46.0	26.	O	B												
46.2	27.	O	B												
46.4	28.	O	B												
46.6	29.	O	B												
46.8	30.	O	B												
46.0	31.	O	B												
46.2	32.	O	B												
46.4	33.	O	B												
46.6	34.	O	B												
46.8	35.	O	B												
46.0	36.	O	B												
46.2	37.	O	B												
46.4	38.	O	B												
46.6	39.	O	B												
46.8	40.	O	B												
46.0	41.	O	B												
46.2	42.	O	B												
46.4	43.	O	B												
46.6	44.	O	B												
46.8	45.	O	B												
46.0	46.	O	B												
46.2	47.	O	B												
46.4	48.	O	B												
46.6	49.	O	B												
46.8	50.	O	B												
47.0	51.	O	*												

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIO 1 1.00	RATIO 2 2.00	RATIOS APPLIED TO FLOWS
HYDROGRAPH AT	1 (	207.00 0.00)	1 (	70984. 2001.59)(	141163. 4003.10)(	
ROUTED TO	1 (	207.00 0.00)	1 (	10154. 293.14)(	30490. 863.37)(	(OWASCO LAKE OUTLET DAM
ROUTED TO	2 (	207.00 0.00)	1 (	10354. 293.20)(	30643. 864.86)(	(MILL ST. DAM

½ PMF PMF

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

OWASCO LAKE OUTLET DAM (NY-776)

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	710.72	710.72	717.00
STORAGE	17712.	17712.	64233.
OUTFLOW	1287.	1287.	6188.

	RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
½ PMF	1.00	719.99	2.99	88204.	10354.	66.00	62.00	0.
PMF	2.00	727.47	10.47	148228.	30490.	95.00	59.00	46.00

SUMMARY OF DAM SAFETY ANALYSIS

PLAN: 1 .....

MILL ST. DAM

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	686.50	696.60	702.06
STORAGE	130.	137.	255.
OUTFLOW	35.	42.	4084.

	RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
½ PMF	1.00	702.31	.75	273.	10354.	41.00	62.00	0.
PMF	2.00	707.20	5.14	375.	30543.	100.00	58.00	0.

```
K1 BREACHED OUTFLOW - ALL GATES FULL OPEN - INFLOW HYDROGRAPH TO MILL ST DAM
Y                                   1       1
Y1      3                                                   -710.72      -1
Y4710.72     711     712  712.82     713  713.27     714  714.85     715  715.12
Y4 715.5  715.87     716   716.5     717   717.5     718
Y5  1287    1350    1777    2265    2388    2584    3175    3953    4106    4221
Y5  5053    5313    5408    5763    6188    6670    7186
$S  6286   12900   17712   19917   26734   33752   40970   48590   56211   64233
$E   709     710  710.72     711     712     713     714     715     716     717
$$710.72
$D   717   3.087     1.5      70
$B    14       0     700       1  710.72     724
K      1       2                                       1
K1ROUTED HYDROGRAPH AT MILL ST DAM - NO BREACH   OUTLET GATE CLOSED-2 GATES OPEN
Y                                   1       1
Y1     1                                                    -696.5      -1
Y4   690  695.92     696   696.5   696.6     697  697.29     701     702  702.06
Y5     8     872     884     973     990    1160    1351    7156    9323    9460
$S    21      55   113.5     137     185     254   255.4
$E   685     690     695   696.6     699     702  702.06
$$ 696.6
$D702.06   3.087     1.5     307
K     99
A
A
A
A
A
```

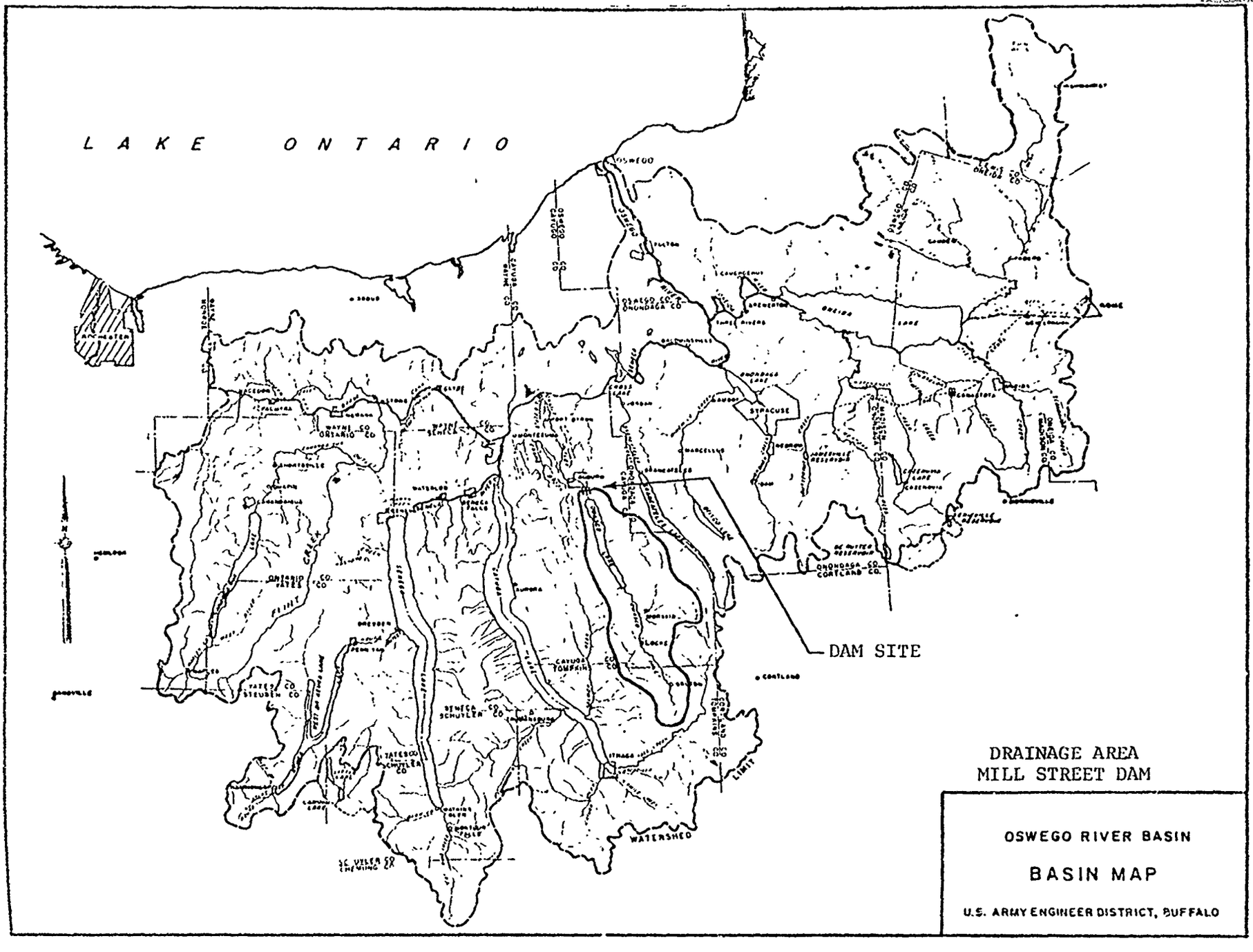
SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

MILL ST. DAM

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	696.50	696.60	702.06
STORAGE	136.	137.	255.
OUTFLOW	973.	990.	9460.

	RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
½ PMF	1.00	702.33	0.32	263.	10354.	24.00	62.00	0.
PMF	2.00	706.89	4.83	368.	30543.	90.00	58.00	0.


LAKE ONTARIO
OSWEGO
SYRACUSE
CORTLAND
DAM SITE
WATERSHED
DRAINAGE AREA
MILL STREET DAM
OSWEGO RIVER BASIN
BASIN MAP
U.S. ARMY ENGINEER DISTRICT, BUFFALO

04235396 OWASCO LAKE NEAR AUBURN, NY

LOCATION.--Lat 42°53'56", long 76°32'17", Cayuga County, Hydrologic Unit 04140201, on west side of breakwater at city of Auburn water intake and pumping station, 1 mi (2 km) south of city limits of Auburn, and 1.8 mi (2.9 km) upstream from State dam.

DRAINAGE AREA.--205 mi² (531 km²).

PERIOD OF RECORD.--October 1967 to current year. Records since 1912 collected by, and in files of, city of Auburn.

GAGE.--Nonrecording gage read once daily by employees of city of Auburn Water Division. Datum of gage (revised) is at mean sea level. Reference mark at elevation 715.48 ft (218.078 m) above mean sea level.

REMARKS.--Lake elevation regulated by gates on outlet at State dam. Area of water surface, 10.6 mi² (27.5 km²).

COOPERATION.--Records furnished by city of Auburn.

EXTREMES FOR PERIOD OF RECORD.--Maximum observed elevation, 716.88 ft (218.505 m) June 25, 1972; minimum observed, 709.55 ft (216.271 m) Mar. 10-14, 1969.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum observed elevation since 1912, 716.91 ft (218.514 m) Mar. 23, 1936, Apr. 9, 1940.

EXTREMES FOR CURRENT YEAR.--Maximum observed elevation, 713.93 ft (217.606 m) Oct. 1; minimum observed, 710.30 ft (216.499 m) Jan. 12, 13.

ELEVATION, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
INSTANTANEOUS OBSERVATIONS AT 0700

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	713.93	711.43	711.64	711.18	710.99	712.76	711.03	712.47	713.01	712.72	712.66	712.70
2	713.63	711.28	711.64	711.08	710.97	712.81	711.26	712.48	713.03	712.78	712.71	712.69
3	713.30	711.22	711.61	711.04	710.88	713.11	711.36	712.45	712.98	712.71	712.73	712.71
4	713.07	711.18	711.62	710.92	710.82	713.59	711.42	712.35	712.95	712.62	712.73	712.73
5	712.88	711.16	711.65	710.80	[illegible]	713.78	711.46	712.33	712.89	712.55	712.70	712.71
6	712.66	711.13	711.61	710.73	[illegible]	713.73	711.50	712.24	712.83	712.48	712.67	712.70
7	712.50	711.10	711.71	710.61	[illegible]	713.53	711.38	712.32	712.82	712.50	712.63	712.68
8	712.33	711.07	711.74	710.49	710.50	713.29	711.41	712.45	712.81	712.50	712.78	712.66
9	712.15	711.03	711.73	710.42	710.41	712.98	711.45	712.53	712.86	712.60	712.80	712.68
10	712.01	711.03	711.92	710.38	710.36	712.81	711.49	712.59	712.90	712.66	712.51	712.71
11	711.86	711.02	712.04	710.36	710.37	712.53	711.52	712.65	712.93	712.69	712.59	712.72
12	711.71	711.08	712.10	710.30	710.37	712.38	711.55	712.83	712.86	712.71	712.65	712.69
13	711.60	711.12	712.03	710.30	710.40	712.16	711.58	712.81	712.88	712.86	712.63	712.63
14	711.60	711.20	712.02	710.33	710.46	711.98	711.61	712.74	712.80	712.97	712.72	712.61
15	711.73	711.27	711.93	710.33	710.56	711.78	711.66	713.15	712.86	712.90	712.79	712.63
16	711.78	711.30	711.92	710.35	710.62	711.63	711.63	712.57	712.82	712.70	712.79	712.61
17	711.74	711.33	711.92	710.33	711.06	711.51	712.43	712.50	712.85	712.55	712.71	712.66
18	711.82	711.34	711.83	710.33	711.85	711.38	712.36	712.52	712.82	712.62	712.71	712.68
19	711.95	711.34	711.72	710.32	712.48	711.26	712.24	712.48	712.80	712.64	712.71	712.68
20	711.95	711.37	711.65	710.32	712.83	711.26	712.28	713.03	712.78	712.70	712.73	712.63
21	711.92	711.46	711.60	710.33	712.84	711.18	712.13	713.29	713.04	712.76	712.73	712.56
22	711.78	711.51	711.50	710.34	712.91	711.38	712.00	713.09	712.82	712.78	712.73	712.48
23	711.71	711.56	711.46	710.38	713.20	711.38	711.88	712.90	712.76	712.83	712.72	712.43
24	711.80	711.57	711.41	710.38	713.12	711.34	711.76	712.68	713.29	712.73	712.71	712.31
25	711.85	711.58	711.39	710.39	712.98	711.26	711.70	712.64	712.61	712.68	712.71	712.27
26	711.88	711.58	711.33	710.41	712.86	711.16	712.11	712.65	713.29	712.72	712.70	712.20
27	711.93	711.59	711.33	710.60	712.86	711.18	712.35	712.65	712.55	712.71	712.70	712.18
28	711.83	711.57	711.33	710.97	712.84	711.08	712.47	712.73	712.51	712.72	712.73	713.18
29	711.69	711.58	711.30	711.05	712.78	711.05	712.58	712.82	712.54	712.73	712.75	712.15
30	711.58	711.64	711.31	711.05	---	710.99	712.57	712.85	712.55	712.74	712.72	712.10
31	711.48	---	711.28	711.03	---	710.95	---	712.94	---	712.62	712.72	---
MEAN	712.12	711.32	711.65	710.58	711.53	712.34	711.81	712.67	712.85	712.69	712.71	712.58
MAX	713.93	711.64	712.10	711.18	713.20	713.78	712.58	713.29	713.29	712.97	712.80	713.18
MIN	711.48	711.02	711.28	710.30	710.36	710.95	711.03	712.24	712.51	712.48	712.51	712.10

WTR YR 1976 MEAN 712.05 MAX 713.93 MIN 710.30
CAL YR 1975 MEAN 711.95 MAX 714.78 MIN 710.46

04235500 OWASCO OUTLET NEAR AUBURN, NY

LOCATION.--Lat 42°56'48", long 76°35'56", Cayuga County, Hydrologic Unit 04140201, on left bank 2.5 mi (4.0 km) downstream from center of Auburn, and 4 mi (6 km) downstream from State dam at outlet of Owasco Lake.

DRAINAGE AREA.--206 mi² (534 km²).

PERIOD OF RECORD.--November 1912 to current year. Prior to October 1966, published as "Owasco Lake Outlet."

REVISED RECORDS.--WSP 824: 1913-14, 1916, 1920(M), 1922(M), 1928(M), 1929, 1932(M). WRD NY 1967: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 533.92 ft (162.739 m) above mean sea level.

REMARKS.--Records fair. Diurnal fluctuation caused by mills in Auburn; seasonal regulation at State dam. Diversion from Owasco Lake (see station 04235396) by city of Auburn for municipal water supply; sewage returns to outlet upstream from station.

AVERAGE DISCHARGE.--63 years (1913-76), 287 ft³/s (8.128 m³/s).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,250 ft³/s (92.0 m³/s) June 23, 1972, gage height, 6.28 ft (1.914 m); minimum, about 2 ft³/s (0.057 m³/s) Dec. 5, 1936; minimum gage height, 1.19 ft (0.363 m) June 26, 1973; minimum daily discharge, 5 ft³/s (0.14 m³/s) Nov. 11, 1934.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,720 ft³/s (48.7 m³/s) Mar. 4, gage height, 4.10 ft (1.250 m); minimum, 14 ft³/s (0.40 m³/s) Oct. 24, gage height, 1.32 ft (0.402 m).

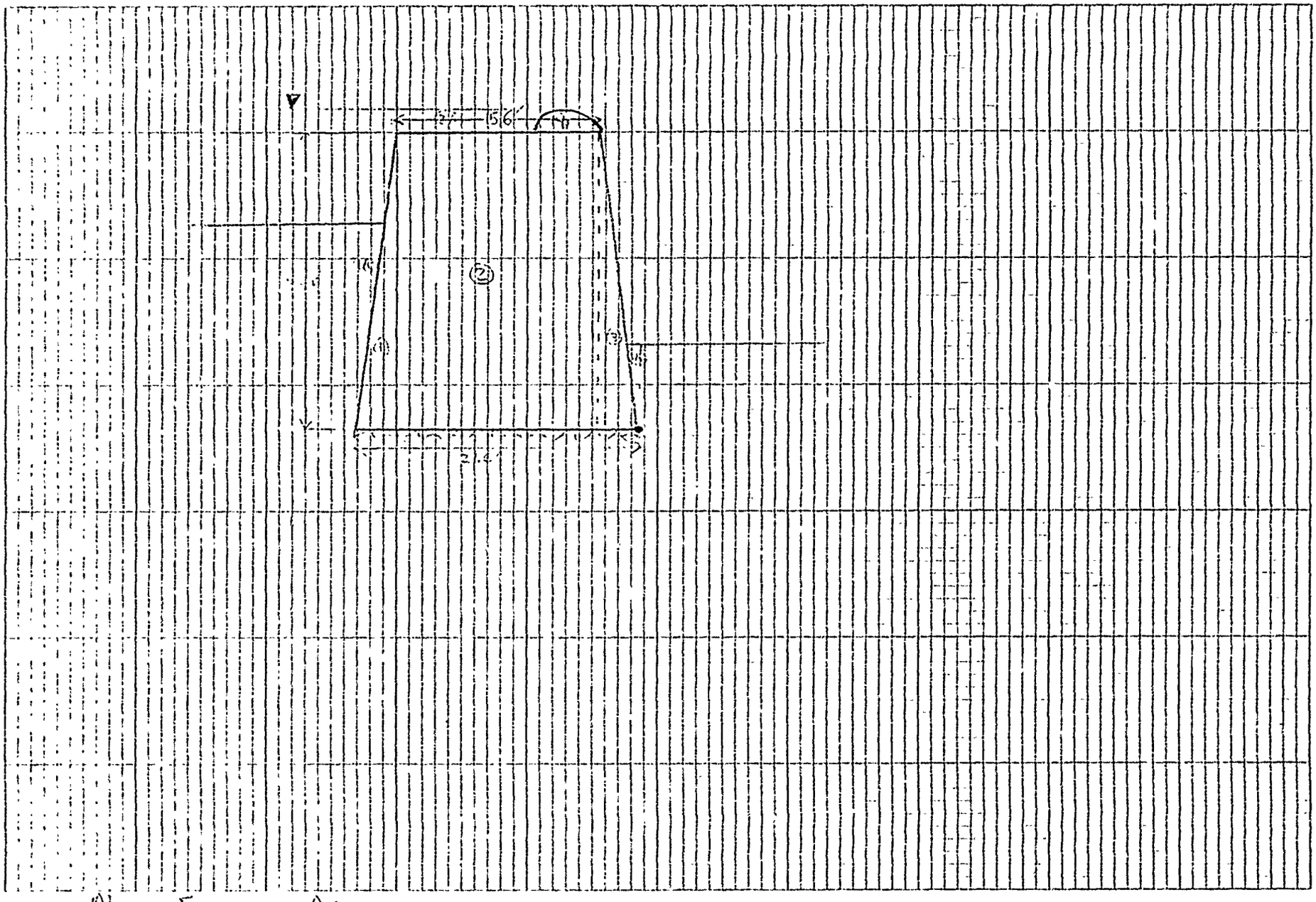
DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1410	446	215	629	653	1250	263	886	320	74	69	45
2	1240	404	287	621	642	1280	140	883	537	277	66	40
3	1130	377	277	596	639	1460	162	864	416	460	107	39
4	1050	351	277	588	631	1540	177	764	355	435	193	36
5	969	314	277	588	627	1650	191	655	346	417	190	35
6	865	297	282	588	621	1600	454	330	342	228	186	34
7	783	287	303	580	615	1520	437	56	343	68	196	36
8	799	267	308	572	611	1450	57	49	236	71	204	36
9	759	257	320	519	607	1340	57	47	46	68	594	37
10	705	262	390	565	605	1240	54	47	50	66	484	101
11	637	248	432	565	323	1140	55	54	148	70	21	198
12	565	267	526	432	116	1100	54	316	265	449	43	195
13	238	277	680	351	123	1010	53	641	257	1030	79	111
14	23	282	654	238	121	950	53	539	208	1190	146	35
15	21	292	637	170	124	890	93	611	206	1130	210	35
16	170	292	621	160	151	847	728	585	354	1070	366	38
17	314	292	604	150	290	820	891	391	342	584	260	42
18	383	292	565	150	831	802	817	401	335	150	66	35
19	397	188	534	140	1150	598	482	411	327	120	66	86
20	654	146	504	54	1210	569	483	904	351	66	65	278
21	759	234	482	50	1230	587	759	1310	850	123	64	262
22	697	248	453	47	1280	588	750	1280	1150	71	63	250
23	303	257	432	46	1340	581	705	1180	796	236	65	240
24	20	184	417	46	1360	570	672	912	434	331	64	221
25	42	262	411	46	1350	624	716	508	320	186	62	210
26	39	262	404	150	1310	582	811	421	307	62	61	213
27	252	262	404	330	1280	489	857	231	300	61	54	208
28	596	262	411	413	1270	468	892	57	179	61	44	198
29	549	267	439	565	1170	465	924	55	72	195	45	193
30	504	282	439	665	---	457	919	54	81	574	42	185
31	475	---	557	660	---	399	---	55	---	299	41	---
TOTAL	17348	8358	13542	11274	22280	28866	13706	15497	10274	10222	4216	3672
MEAN	560	279	437	364	768	931	457	500	342	330	136	122
MAX	1410	446	680	665	1360	1650	924	1310	1150	1190	594	278
MIN	20	146	215	46	116	399	53	47	46	61	21	34

CAL YR 1975 TOTAL 127965 MEAN 351 MAX 1790 MIN 18
WTR YR 1976 TOTAL 159255 MEAN 435 MAX 1650 MIN 20

APPENDIX D

STABILITY COMPUTATIONS



Mill Stream Dam

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
MILL STREET DAM	1		
SUBJECT		**COMPUTED BY**	**DATE**
STABILITY ANALYSIS		RLW	9/5/79

SUB AREA CALCULATIONS

(1A) SOIL UPSTREAM

$\frac{1}{2}(16.5)(2.5)(.12) = 2.47\,K$

CONVERT TO EQUIVALENT AREA OF CONCRETE

$\frac{2.47}{.15} = 16.5\ ft^3$

(2A) WATER ON DAM

$2(15.6)(.062H) = 1.75$

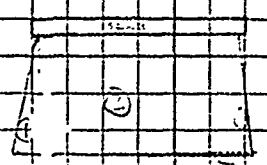
CONVERT TO EQUIVALENT AREA

$\frac{1.75}{.15} = 12.92\ ft^3$

(2B) FRONT

SLAB $(12ft)(14ft)(1ft) = 12\ ft^3$

AREAS



WEDGE $(2)[\frac{1}{2}(.8)(6.5)(3.1)(.15)] = 2.42$

$(11.5)(6.5)(3.1)(.15) = 34.78$

$\frac{37.18\,K}{20\,ft} = 1.86\,K/ft$ of dam

CONVERT TO EQUIVALENT AREA

$\frac{1.86}{.15} = 12.4\ ft^3$

TOTAL $= 14.37\ ft^3 = 47.3\ ft^3$

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
MILL STREET DAM	2		
SUBJECT		**COMPUTED BY**	**DATE**
STABILITY ANALYSIS		RLW	0/5/79

SUB AREA CALCULATIONS

(2A) SOIL DOWNSTREAM

$\frac{1}{2}(17)(1)(.12) = .92$

CONVERT TO EQUIVALENT AREA

$\frac{.92}{.15} = 2.8 \text{ ft}^2$

(3) WEDGE

(A) $(5.76)(.5) = 2.93$
(B) $\frac{1}{2}(2.93)(2) = 2.93$
(C) $\frac{1}{2}(2.93)(2) = 2.93$
8.79 ft^2

AREA CALCULATIONS

AREA NO.	VOLUME	DISTANCE from Upstream Toe to Toe
1	$\frac{1}{2}(23.5)(3) + 6.5 = 51.75 \text{ ft}^3$	19 ft
2	$(15.6)(23.5) + 12.93 + 2 + 7.39 = 403.97 \text{ ft}^3$	103 ft
3	$\frac{1}{2}(23.5)(30) + 2.2 = 38.05 \text{ ft}^3$	20 ft
4	8.79 ft^3	5.93 ft

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
MILL STREET DAM	3		
SUBJECT		**COMPUTED BY**	**DATE**
STABILITY ANALYSIS		RLW	9/5/79

REVISED ANALYSIS TO ACCOUNT FOR ROUGH SURFACE BETWEEN CONCRETE & ROCK

$$F.S._{sliding} = \frac{\text{RESISTING FORCE} + S_s A}{\text{DRIVING FORCE}}$$

S_s = SHEAR STRENGTH OF CONCRETE

A = AREA OF BASE

THE SAFETY FACTOR SHOULD BE > 5

NORMAL CONDITIONS

$$F.S._{sliding} = \frac{44.39 + .15[(21.6)(1)(144\,\frac{in^2}{ft^2})]}{22.49} = 22.71$$

ICE LOAD of 10,000#

$$F.S._{sliding} = \frac{44.39 + .15[(21.6)(1)(144\,\frac{in^2}{ft^2})]}{29.99} = 17.04$$

½ PMF

$$F.S._{sliding} = \frac{44.38 + .15[21.6(1)(144\,\frac{in^2}{ft^2})]}{31.18} = 16.39$$

PMF

$$F.S._{sliding} = \frac{44.38 + .15[21.6(1)(144\,\frac{in^2}{ft^2})]}{37.04} = 13.79$$

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
MILL STREET DAM	4		
SUBJECT		**COMPUTED BY**	**DATE**
STABILITY ANALYSIS - SEISMIC ANALYSIS		RLW	9/5/79

NORMAL CONDITIONS - WATER AT SPILLWAY CREST - NO ICE

1. CALCULATE HORIZONTAL FORCE ON FACE DUE TO WATER PRESSURE

$P_w = C\lambda wh = .7(.11)(.0625)(23.5) = .103$

2. CALCULATE MOMENT & FORCE OF EARTHQUAKE

$M_e = .299 P_w y^2 = .299(.103)(23.5)^2 = 16.75$

$V_e = .726 P_w y = .726(.103)(23.5) = 1.76$

3. REDUCE WEIGHT OF CONCRETE BY 5%

$(.15)(.95) = .142$

4. REVISED OVERTURNING F.S. - SEISMIC ANALYSIS

$F.S. = \frac{\text{Resist Moment}}{\text{Overturning Moment}} = \frac{798}{466 + 16.75} = 1.65$

5. REVISED SLIDING F.S. - SEISMIC ANALYSIS

$F.S. = \frac{\text{Resist Force}}{\text{Sliding Force} + V_e} = \frac{41.57}{23.49 + 1.76} = 1.71$

INPUT TO STABILITY ANALYSIS PROGRAM

INPUT ENTRY	PROGRAM No.
Unit Weight of Dam (K/ft^3)	0
Area of Segment No. 1 (ft^2)	1
Distance from Center of Gravity of Segment No. 1 to Downstream Toe (ft)	2
Area of Segment No. 2 (ft^2)	3
Distance from Center of Gravity of Segment No. 2 to Downstream Toe (ft)	4
Area of Segment No. 3 (ft^2)	5
Distance from Center of Gravity of Segment No. 3 to Downstream Tow (ft)	6
Base Width of Dam (Total) (ft)	7
Height of Dam (ft)	8
Ice Loading (K/L ft.)	9
Coefficient of Sliding	10
Unit Weight of Soil (K/ft^3)	11
Active Soil Coefficient - Ka	12
Passive Soil Coefficient - Kp	13
Height of Water over Top of Dam or Spillway (ft)	14
Height of Soil for Active Pressure (ft)	15
Height of Soil for Passive Pressure (ft)	16
Height of Water in Tailrace Channel (ft)	17
Weight of Water (K/ft^3)	18
Area of Segment No. 4 (ft^2)	19
Distance from Center of Gravity of Segment No. 4 to Downstream Toe (ft)	20
Height of Ice Load or Active Water (ft)	46

NORMAL

0.15	RCL 1
51.75	RCL 2
51.75	
19.6	RCL 3
19.6	
404.	RCL 4
404.	
10.8	RCL 5
10.8	
38.	RCL 6
38.	
2.	RCL 7
2.	
21.6	RCL 8
21.6	
25.5	RCL 9
25.5	
0.	RCL 10
0.	
0.7	RCL 11
0.7	
0.06	RCL 12
0.06	
0.27	RCL 13
0.27	
3.69	RCL 14
3.69	
0.	RCL 15
0.	
16.5	RCL 16
16.5	
7.	RCL 17
7.	
7.	RCL 18
7.	
0.0624	RCL 19
0.0624	
8.8	RCL 20
8.8	
5.9	RCL 46
5.9	
25.5	

1.806930513
7.031267154

F.S. OVERTURNING

ICE LOAD

0.15	RCL 1
51.75	RCL 2
51.75	
19.6	RCL 3
19.6	
404.	RCL 4
404.	
10.8	RCL 5
10.8	
38.	RCL 6
38.	
2.	RCL 7
2.	
21.6	RCL 8
21.6	
25.5	RCL 9
25.5	
7.5	RCL 10
7.5	
0.7	RCL 11
0.7	
0.06	RCL 12
0.06	
0.27	RCL 13
0.27	
3.69	RCL 14
3.69	
0.	RCL 15
0.	
16.5	RCL 16
16.5	
7.	RCL 17
7.	
7.	RCL 18
7.	
0.0624	RCL 19
0.0624	
8.8	RCL 20
8.8	
5.9	RCL 46
5.9	
25.5	

1.281143762
3.455170624

½ PMF

0.15	RCL 1
51.75	
51.75	RCL 2
19.6	
19.6	RCL 3
404.	
404.	RCL 4
10.8	
10.8	RCL 5
38.	
38.	RCL 0
0.15	
2.	RCL 7
21.6	
21.6	RCL 8
25.5	
25.5	RCL 9
0.	
0.	RCL 10
0.7	
0.7	RCL 11
0.06	
0.06	RCL 12
0.27	
0.27	RCL 13
3.69	
3.69	RCL 14
5.46	
5.46	RCL 14
5.46	
5.46	RCL 15
16.5	
16.5	RCL 16
7.	
7.	RCL 17
7.	
7.	RCL 18
0.0624	
0.0624	RCL 19
8.8	
8.8	RCL 20
5.9	
5.9	RCL 46
25.5	

PMF

0.15	RCL 1
51.75	
51.75	RCL 2
19.6	
19.6	RCL 3
404.	
404.	RCL 4
10.8	
10.8	RCL 5
38.	
38.	RCL 6
2.	
2.	RCL 7
21.6	
21.6	RCL 8
25.5	
25.5	RCL 9
0.	
0.	RCL 10
0.7	
0.7	RCL 11
0.06	
0.06	RCL 12
0.27	
0.27	RCL 13
3.69	
3.69	RCL 14
9.14	
9.14	RCL 15
16.5	
16.5	RCL 16
7.	
7.	RCL 17
7.	
7.	RCL 18
0.0624	
0.0624	RCL 19
8.8	
8.8	RCL 20
5.9	
5.9	RCL 46
25.5	

1.459904279 — F.S. OVERTURNING — 1.292588698

4.960003487 — 3.563398695

~~17.4295~~ — ~~17.4295~~

SEISMIC ANALYSIS

0.142	RCL 1
51.75	
51.75	RCL 2
19.6	
19.6	RCL 3
404.	
404.	RCL 4
10.8	
10.8	RCL 5
38.	
38.	RCL 6
2.	
2.	RCL 7
21.6	
21.6	RCL 8
25.5	
25.5	RCL 9
0.	
0.	RCL 10
0.7	
0.7	RCL 11
0.06	
0.06	RCL 12
0.27	
0.27	RCL 13
3.69	
3.69	RCL 14
0.	
0.	RCL 15
16.5	
16.5	RCL 16
7.	
7.	RCL 17
7.	
7.	RCL 18
0.0624	
0.0624	RCL 19
8.8	
8.8	RCL 20
5.9	
5.9	RCL 46
25.5	

~~1.712413002~~
6.712323579
~~1.84334507~~

DATE
STARTED 4-21-75
FINISHED 4-21-75
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS, INC.

SUBSURFACE LOG

HOLE NO. B-1
SURF. ELEV. 698.74
G. W. DEPTH See Note #1

PROJECT Subsurface Exploration
Osborne Street

LOCATION Auburn, New York

DEPTH FT.	SAMPLE	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	BLOWS ON CASING C	SOIL OR ROCK CLASSIFICATION	NOTES
0	/	1	3	4	9	13		Dark Brown to Black FILL MATERIAL: SILT, SAND, ROCK FRAGMENTS w/ scattered cobbles, boulders & concrete	Note #1 - At completion water @ 7.0', casing raised to 15.0', water @ 7.5', casing out, water @ 7.6'
5	/	2	6	4	12	16		-Moist	Note #2 - Coring Time:
								(Damp to Moist-Firm)	21' - 22' 10 minutes 22' - 23' 7 " 23' - 24' 15 " 24' - 25' 17 " 25' - 26' 15 "
10	/	3	2	2	3	5		Brown & Gray SILT, Some Rock Fragments, little to Some Clay	
15	/	4	5	7	9	16		-trace organic	
								(Wet-Soft to Stiff)	
20	/	5	65	100/1				Black SHALE, highly weathered, soft, fissile, slightly calcareous, iron staining along bedding planes, with a seam of sound, medium hard Dolomitic LIMESTONE from 21.0' to 21.[illegible]	Run #1 21.0' - 26.0'
25								Gray & Dark Gray Dolomitic LIMESTONE, slightly weathered to sound, medium hard, argillaceous slightly fossiliferous	100% Recovery
30								Bottom of Hole @ 26.0'	

N = No. blows to drive 2 "spoon 12 "with 140 lb. pin wt. falling 30 "per blow.
C = No. blows to drive ____ "casing ____ "with ____ lb. weight falling ____ "per blow.
METHOD OF INVESTIGATION Cased Boring; drill [illegible] in place, "B" Core

CLASSIFICATION Visual by Laboratory Technician

STARTED 4-21-75
FINISHED 4-21-75
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS, INC.

SUBSURFACE LOG

HOLE NO. B-2
SURF. ELEV. 693.77
G.W. DEPTH See Note #1

OWNER Subsurface Exploration
Osborne Street

LOCATION Auburn, New York

DEPTH	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	BLOWS ON CASING C	SOIL OR ROCK CLASSIFICATION	NOTES
	1	5	9	9	18		Dark Gray to Black SAND, SILT & ROCK FRAGMENTS	Note #1 - Encountered water @ 10.0', at completion water @ 6.5', casing raised to 15.0', water @8.0' Casing out, hole caved in to 2.0'
5	2	4	2	3	5			
10	3	3	1	1	2		-Wet	
15	4	3	4	6	10		-grades SILT & fine ROCK FRAGMENTS trace to little clay	
20	5	35	100/3"				Black SHALE, highly weathered soft, fissile, with a few thin embedded seams of Dolomitic LIMESTONE, recovered in pieces less than 1" to 2"	Run #1 22' to 25' 80% Recovery
25	6							Run #2 25' to 27' 85% Recovery
30							Bottom of Hole @ 27.0'	

N = No. blows to drive 2 "spoon 12 "with 140 lb. pin wt. falling 30 "per blow.
C = No. blows to drive ____ "casing ____ "with ____ lb. weight falling ____ "per blow.
METHOD OF INVESTIGATION: Cased Boring; drilled in place; "B" Core

CLASSIFICATION Visual by Laboratory Technician

DATE		
STARTED 4-22-75	EMPIRE SOILS INVESTIGATIONS, INC.	HOLE NO. B-3
FINISHED 4-22-75	SUBSURFACE LOG	SURF. ELEV. 694.48
SHEET 1 OF 1		G. W. DEPTH Not Encountered

PROJECT Subsurface Exploration Osborne Street

LOCATION Auburn, New York

DEPTH FT	SAMPLES	SAMPLE NO.	BLOWS ON SPLIT SPOON 0/6	6/12	12/18	N	BLOWS ON CASING C	SOIL OR ROCK CLASSIFICATION	*	NOTES
0								CONCRETE 0.3'	20	Run #1 0' to 5'
								Gray LIMESTONE, sound, medium hard, slightly fractured 9WALL)	15	
									12	
									17	
5									16	85% Recovery
								Partial VOIDS-5.5' - 8.0'	10	Run #2 5' to 10'
									12	
									2	
								Gray LIMESTONE, sound, medium hard, slightly fractured	4	
10									15	58% Recovery
								Partial VOIDS-10.0'-11.0'	2	Run #3 10' to 15'
									5	
								LIMESTONE from 15.0' to 22.0' is fractured & recovered in pieces less than 2" [illegible]	7	
									5	
15									2	56% Recovery
								Gray SANDSTONE-15.7' - 16.1'	3	Run #4 15' to 20'
								VOID 16.8' - 17.5'	4	
								[illegible]	5	
									3	
20								VOID 18.6' - 20.0'	12	54% Recovery
								Dark [illegible] SHALE, slightly [illegible] TOP OF BEDROCK	3	Run #5 20' to 25'
									3	
								Dark Gray to Black SHALE, slightly weathered to weathered, soft to medium hard, fissile	5	
									7	
25									10	77.4% Recovery
								Bottom of Hole @ 25.0'		*Coring time in minutes
										Note #1 - Hole began caving in at several depths after completion Run #5
										Note #2 - Limestone & Sandstone are the materials encountered in the wall

N = No. blows to drive 2 "spoon 12 "with 140 lb. pin wt. falling 30 "per blow.

C = No. blows to drive ____ "spoon ____ "with ____ lb. wt. falling ____ "per blow.

METHOD OF INVESTIGATION [illegible]

CLASSIFICATION Visual by Laboratory Technician

DATE
STARTED 4-25-75
FINISHED 4-25-75
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS, INC.

SUBSURFACE LOG

HOLE NO. B-4
SURF. ELEV. 679.94
G.W. DEPTH Not Encountered

PROJECT Subsurface Exploration, Osborne Street
LOCATION Auburn, New York

DEPTH FT	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0 to 6	6 to 12	12 to 18	N	BLOWS ON CASING C	SOIL OR ROCK CLASSIFICATION	NOTES
0		1	1	2	3	5		Brown & Black FILL: SAND, SILT & ROCK FRAGMENTS (Wet-Loose)	Run #1 2.0' to 7.0'
								CONCRETE 2.0' - 3.6'	
5								Gray LIMESTONE, sound, medium hard	48% Recovery
								Green Pyroxenite, sound, hard, fractured	
								Dark Gray to Black interbedded SHALE & Dolomitic LIMESTONE, slightly weathered to weathered, slightly fractured, soft to medium hard	Run #2 7.0' to 12.0'
10									85% Recovery
								Bottom of Hole @ 12.0'	Note #1 - Concrete, Limestone & Pyroxenite are the materials encountered in the wall

N = No. blows to drive 2 "spoon 12 "with 140 lb. pin wt. falling 30 "per blow.
C = No. blows to drive ____ "casing ____ "with ____ lb. weight falling ____ "per blow.
METHOD OF INVESTIGATION: Cased Boring; drilled in place, " Core

CLASSIFICATION Visual by Laboratory Technician

DATE
STARTED 4-24-75
FINISHED 4-24-75
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS, INC.

SUBSURFACE LOG

HOLE NO. B-5
SURF. ELEV. 679.93
G. W. DEPTH See Note #1

PROJECT Subsurface Exploration
Osborne Street

LOCATION Auburn, New York

DEPTH-FT.	SAMPLES	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	BLOW OR CASING C	SOIL OR ROCK CLASSIFICATION	NOTES
0		1	3	3	6	9		Brown fine SAND & SILT, little fibrous organic material, scattered boulders and/or cobbles, becomes wet @ 3.5', pieces of decomposed wood from 5.0'-5.5' (Wet-Loose)	Note #1 - At completion water @ 3.5'
5		2	10	42	80	122	[illegible]	Black SHALE, highly weathered to 6.5', from 6.5' to 7.5' weathered, 7.5' - 8.5' highly weathered, soft, fissile, fractured	Run #1 6.5' to 11.5' Soft 7.5' to 8.5' 50% Recovery
10								Bottom of Hole @ 11.5'	

N = No. blows to drive 2 "spoon 12 "with 140 lb. pin wt. falling 30 "per blow.
C = No. blows to drive ____ "casing ____ "with ____ lb. weight falling ____ "per blow.

CLASSIFICATION Visual by Laboratory Technician

METHOD OF INVESTIGATION Cased Boring; drilled in place, "B" Core

DATE
STARTED 4-23-75
FINISHED 4-24-75
SHEET 1 OF 2

EMPIRE SOILS INVESTIGATIONS, INC.

SUBSURFACE LOG

HOLE NO. B-6
SURF. ELEV. 703.86
G. W. DEPTH See Note #1

PROJECT Subsurface Exploration
Osborne Street

LOCATION Auburn, New York

DEPTH FT.	SAMPLE	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18-N	BLOWS ON CASING C	SOIL OR ROCK CLASSIFICATION	NOTES
0	/	1	3	8	10	18		Brown FILL: SILT, SAND, CINDERS, BRICK, scattered boulders and/or cobbles (Moist-Firm)	Note #1 - Encountered water @ 24.0', at completion water @ 24.2'
5	/	2	2	3	4	7		Brown fine SAND & SILT w/scattered boulders and/or cobbles (Moist to Wet-Loose)	Note #2 - Coring time 37' to 38' 15 min. 38' to 39' 15 min. 39' to 40' 20 min. 40' to 41' 17 min. 41' to 42' 20 min.
10	/	3	4	8	9	17		Brown & Dark Brown SILT, little organic silt, little fine gravel (Moist-Firm)	
15	/	4	10	12	18	30		Brown & Gray varved SILT, trace fine sand -grades Gray @ 16.0' (Moist-Firm)	
20	/	5	20	29	58	87		Gray SILT w/ trace fine sand seams (Damp-Very Compact)	
25	/	6	100/1"					Driller notes SAND, SILT, GRAVEL and BOULDER from 25.0' to 36.5', the recovered rock ranges in length from ½" to 4" pieces (Material appears to be a very boney GLACIAL TILL) (Very Compact)	Run #1 26' to 28' 70% Recovery Run #2 28' to 32' 33% Recovery Run #3 32' to 37' 20% Recovery
30									
35									
40								Dark Gray to Black interbedded SHALE & Dolomitic LIMESTONE, Shale is highly weathered, soft, LIMESTONE is slightly weathered	Run #4 37' to 42' 90% Recovery

N = No. blows to drive 2 "spoon 12 "with 140 lb. pin w.t. falling 30 "per blow.
C = No. blows to drive _____ "casing _____ "with _____ lb. w[illegible] _____ "[illegible]

CLASSIFICATION Visual by [illegible] Technician

METHOD OF INVESTIGATION [illegible]

DATE
STARTED 4-23-75
FINISHED 4-24-75
SHEET 2 OF 2

EMPIRE SOILS INVESTIGATIONS, INC.

SUBSURFACE LOG

HOLE NO. B-6 cont'd
SURF. ELEV. 703.86
G. W. DEPTH

PROJECT Subsurface Exploration
Osborne Street

LOCATION Auburn, New York

DEPTH-FT	SAMPLE	SAMPLE NO.	BLOWS ON SAMPLER 0/6 6/12 12/18 N	BLOW ON CASING C	SOIL OR ROCK CLASSIFICATION	NOTES
					medium hard	
					Gray LIMESTONE, slightly weathered to sound, medium hard, slightly fracture, slightly fossiliferous	
45					Bottom of Hole @ 42.0'	

N = No. blows to drive 2 "spoon 12 "with 140 lb. pin wt. falling 30 "per blow.
C = No. blows to drive _____ "casing _____ "with _____ lb. pin wt. falling _____ "per blow.
METHOD OF INVESTIGATION [illegible] "B" Core

CLASSIFICATION Visual by Laboratory Technician

APPENDIX E

REFERENCES

APPENDIX E

REFERENCES

1) U.S. Army, Corps of Engineers:

   a) Design Memorandum on Local Flood Protection - Auburn, New York; Buffalo District, May 1960.

   b) HEC-1 Flood Hydrograph Package - Dam Safety Version, September 1978.

   c) Operation and Maintenance Manual for Local Flood Protection Project on Owasco Outlet at Auburn, New York; Buffalo District, September 1961.

   d) Owasco Lake - Standard Project Flood Hydrograph; Buffalo District; July 14, 1975 letter.

2) U.S. Department of Agriculture, Soil Conservation Service; National Engineering Handbook; Section 4 - Hydrology, August 1972.

3) U.S. Department of the Interior, Bureau of Reclamation:

   a) Design of Small Dams, 2nd Edition (Rev. report), 1977.

   b) Hydraulic and Excavation Table, 11th Edition, (Reprinted) 1974.

4) U.S. Department of the Interior, Geological Survey; Water Resources Data for New York - Water Year 1976 - Vol. 1, USGS Report NY-76-1, 1977.

5) H. W. King and E. F. Brater; Handbook of Hydraulics, 5th Edition, McGraw-Hill, 1963.

6) R. K. Linsley, Jr., M. A. Kohler, and J. L. H. Paulhus; Hydrology for Engineers, 2nd Edition, McGraw-Hill, 1975.

7) University of the State of New York; Geology of New York, Education Leaflet 20, (Reprint) 1973.

8) C. V. Davis and K. E. Sorenson, Handbook of Applied Hydraulics, 3rd Edition, McGraw-Hill, 1970.

9) Engineer's Design Report on Renovation of Mill Street Dam - City of Auburn - Project No. 7240; Konski Engineers, P.C.; Syracuse, N.Y., May 20, 1975.

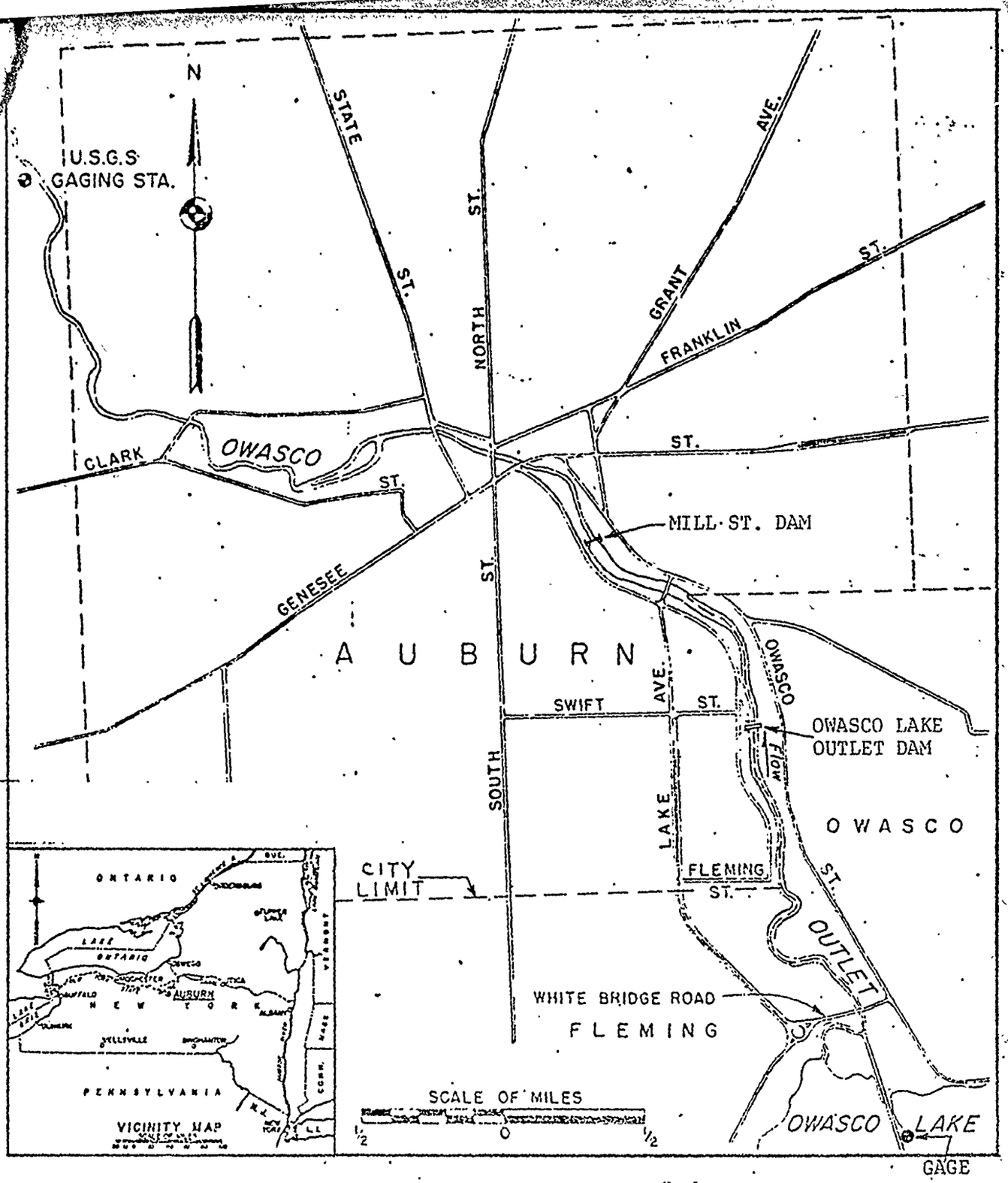
10) Alsthom Atlantic, Inc., New York, New York:

   a) Bulletin No. 16A - Amil Constant Upstream Level Gate, 1973.

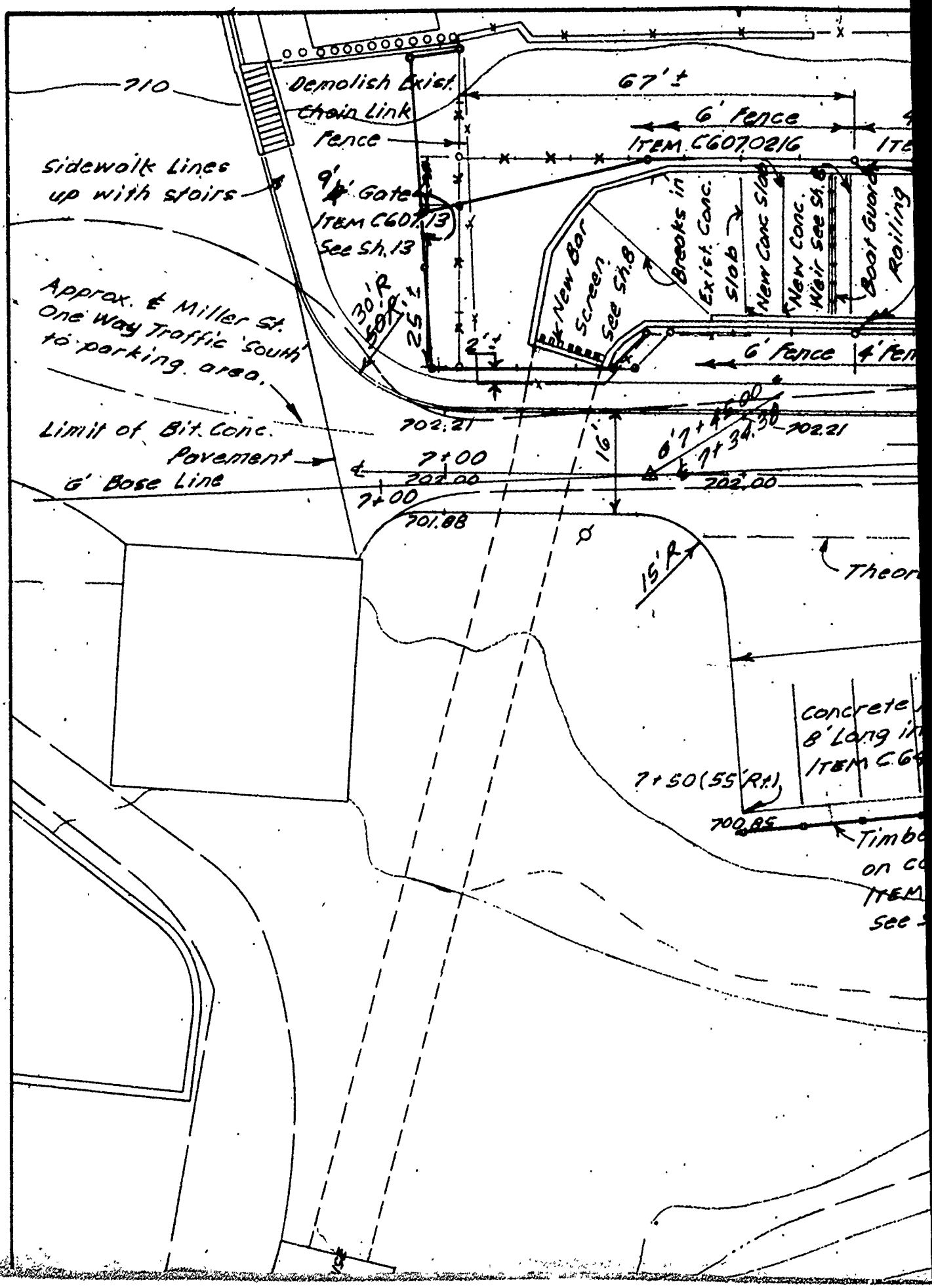
   b) Supplement No. 16-2 - Summary of Important Facts and Supplemental Information for the Amil Constant Upstream Level Gate.

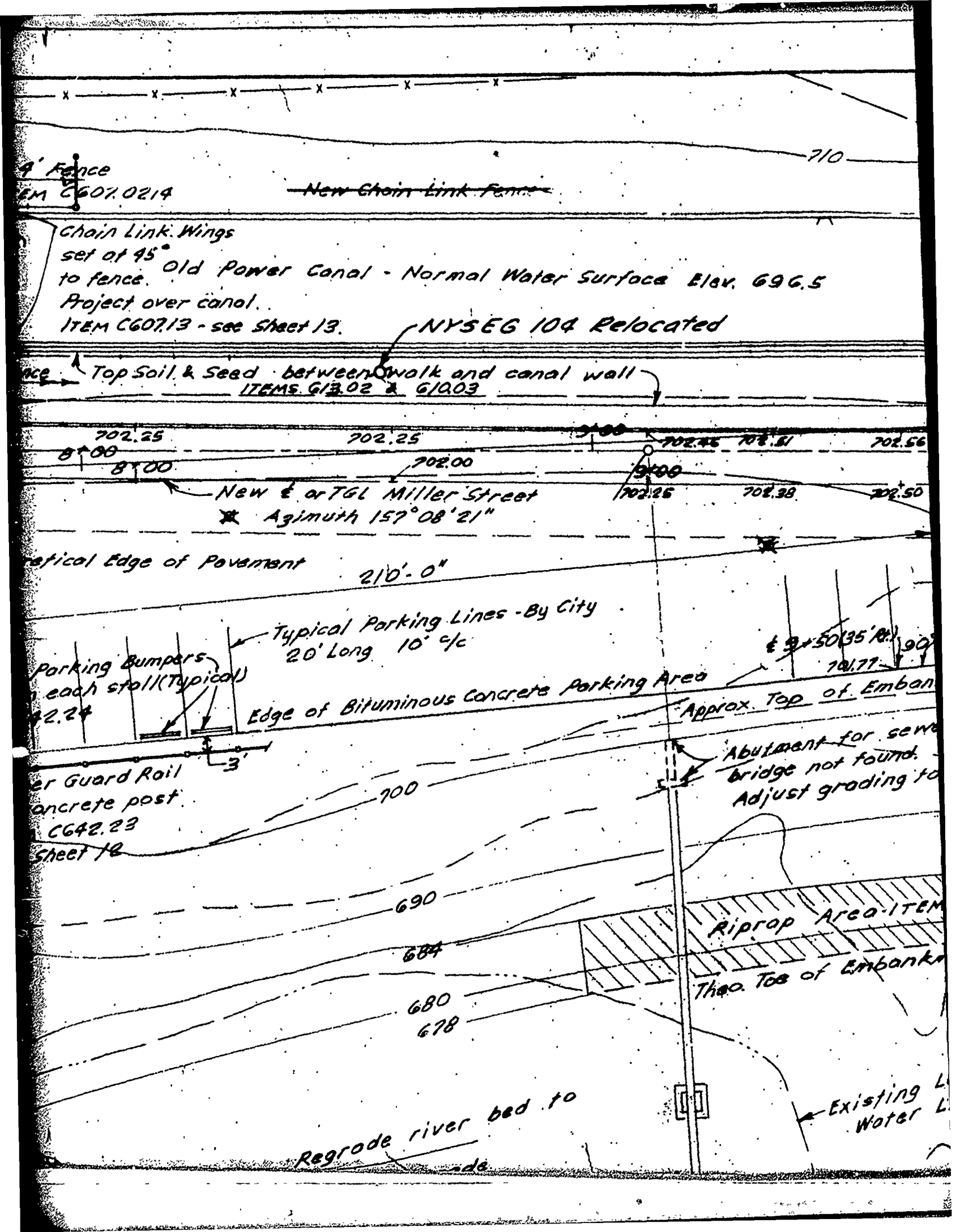
APPENDIX F

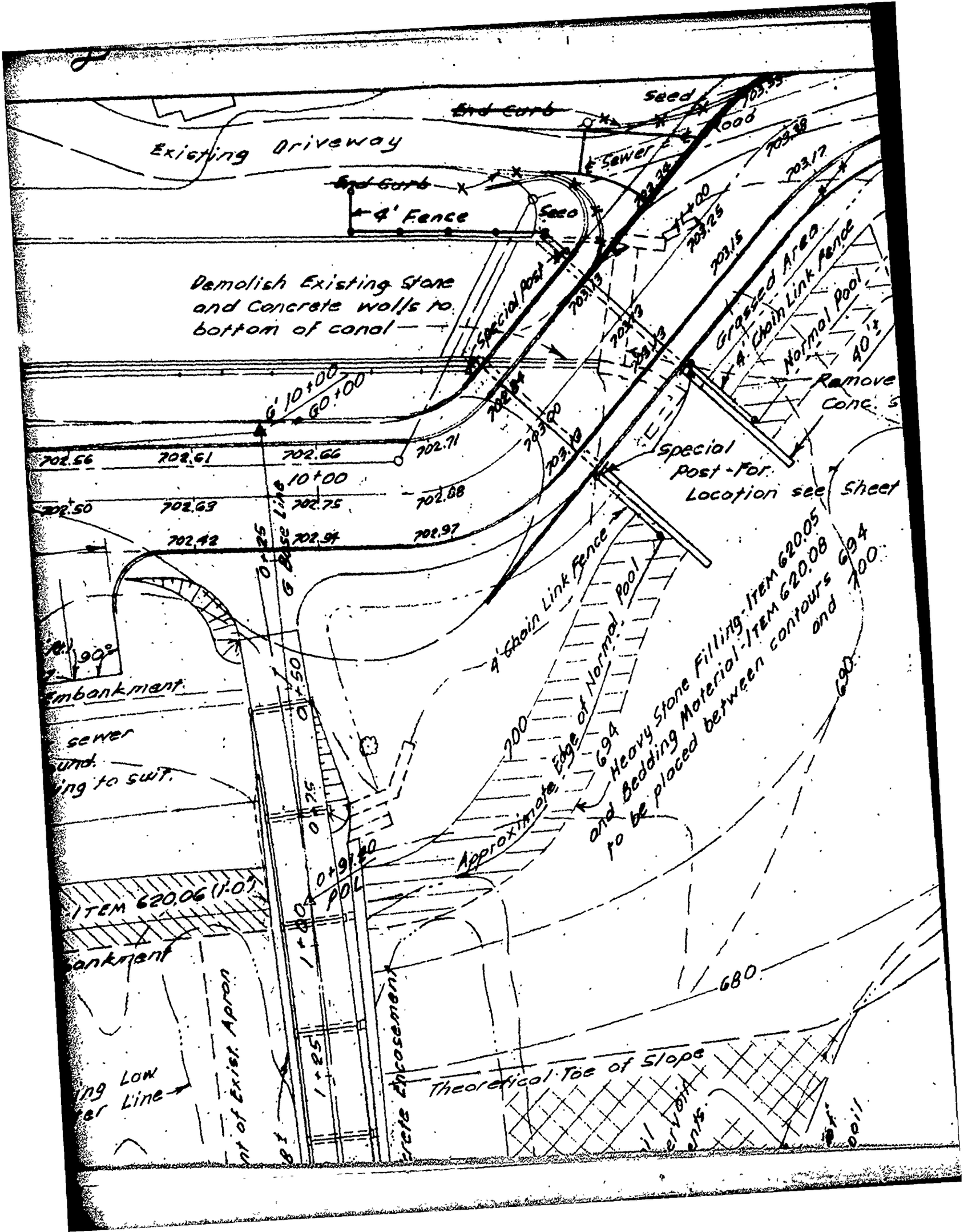
DRAWINGS

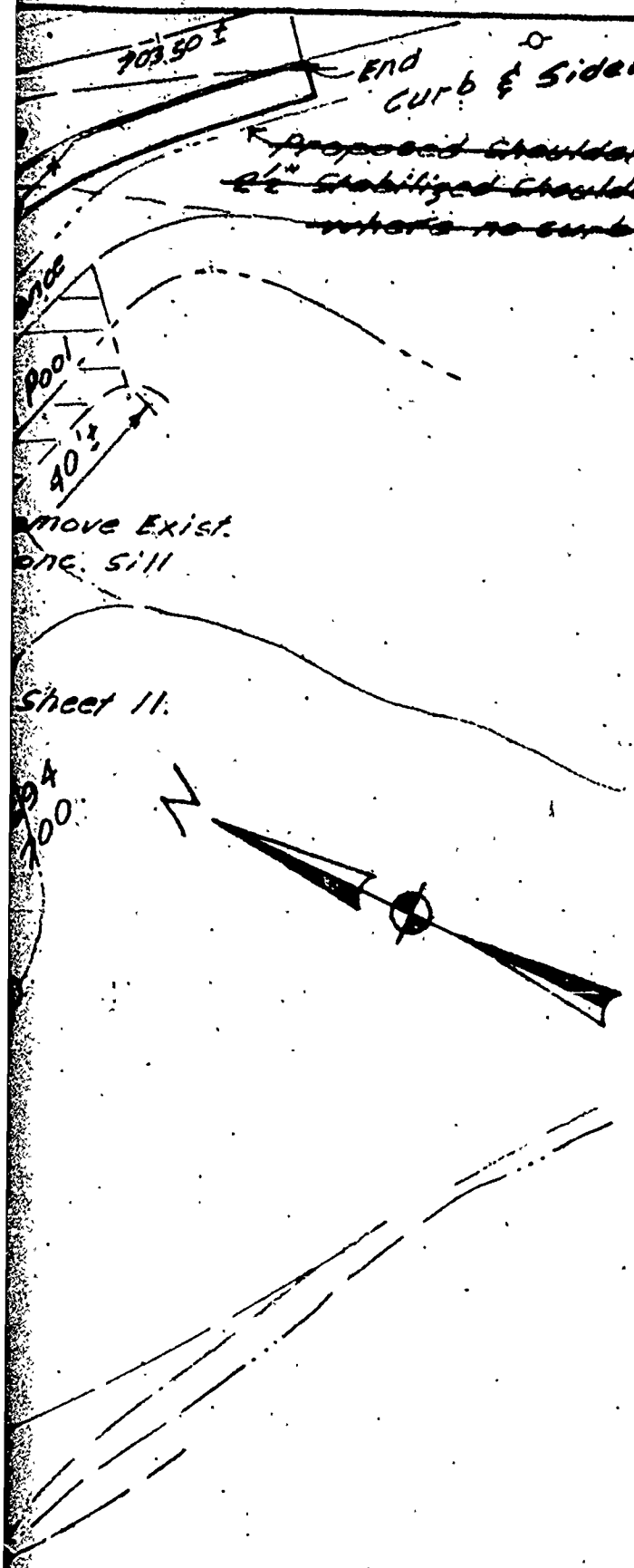


LOCATION MAP
MILL STREET DAM
NY-775


710
Demolish Exist. Chain Link Fence
67'±
6' Fence
ITEM C607.0216
Sidewalk Lines up with stairs
9' Gate
ITEM C607.13
See Sh. 13
New Bar Screen See Sh. 8
Brooks in Exist. Conc. Slab
New Conc. Slab
New Conc. Weir See Sh. 8
Boat Guard Railing
Approx. ℄ Miller St. One Way Traffic South to parking area.
30'R
50'R±
25'±
2'±
6' Fence
4' Fen
Limit of Bit. Conc. Pavement
6' Base Line
702.21
7+00
702.00
16'
6'
7+34.30
702.21
702.00
7+00
701.88
15'R
Theor
concrete
8' Long
ITEM C.6
7+50 (55' Rt.)
700.85
Timbe
on co
ITEM
see


710
9' Fence
EM C607.0214
~~New Chain Link Fence~~
Chain Link Wings
set at 45°
to fence.
Old Power Canal - Normal Water Surface Elev. 696.5
Project over canal.
ITEM C607.13 - see Sheet 13.
NYSEG 104 Relocated
Top Soil & Seed between walk and canal wall
ITEMS 613.02 & 610.03
702.25
702.25
702.00
702.46
702.81
702.56
702.26
702.38
702.50
New ℄ or TGL Miller Street
Azimuth 157°08'21"
Edge of Pavement
210'-0"
Typical Parking Lines - By City
20' Long 10' c/c
Parking Bumpers
each stall (Typical)
Edge of Bituminous Concrete Parking Area
Approx. Top of Emban
Abutment for sewe
bridge not found.
Adjust grading to
Guard Rail
concrete post
C642.23
Sheet 18
3'
700
690
684
680
678
Riprap Area - ITEM
Theo. Toe of Embankm
Existing L
Water L
Regrade river bed to


Existing Driveway
End Curb
Seed
Sewer
4' Fence
Demolish Existing Stone and Concrete walls to bottom of canal
Special post
Grassed Area
4' Chain Link fence
Normal Pool
Remove Conc.
Special Post - For Location see Sheet
Base Line
Embankment
sewer
4' Chain Link fence
Approximate Edge of Normal Pool
Heavy Stone Filling - ITEM 620.05 and Bedding Material - ITEM 620.08 to be placed between contours 694 and 700
ITEM 620.06 (1:0)
Pool
Theoretical Toe of Slope
Low Line
Exist. Apron
Concrete Encasement



NOTES:

(1) CURVE DATA FOR ℄ BRIDGE AND AXIS OF DAM:
Degree of Curve 4°-00'-00"
Radius 1432.40'
△Angle between intercepts on G-Baseline 4°-26'-5
Corresponding chord 111.22', corresponding offset
Coordinate Point at ℄ Dam G1+80.33, 0.69' Left
Angle between ℄ Dam and G-Baseline 88°-39'-32.7
Length of ℄ Bridge and Dam Axis 280'-0"
Corresponding △Angle 11°-12'-00"

(2) Only sufficient contour lines are given to generally
new grading.

(3) Instead of a profile, spot elevations are given on pa
areas. Spot elevations at curb lines are at base of c

(4) All curb ends to be transitioned from 0" to 6" in 12'-

(5) Seed and mulch all cut or new fill areas on embankm
above water line.

(6) No finished embankment is to be steeper than 1 vert
2 horizontal.

(7) Payment Items for Roadway and Parking Area: (See S

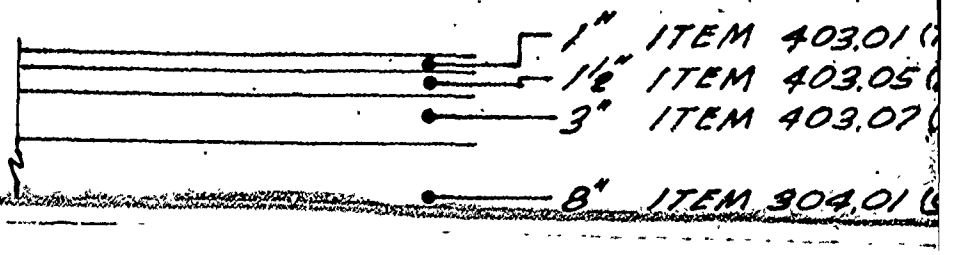
Asphalt Concrete Topping Type 1A - Item 403.

Asphalt Concrete Binder Type 1A-1½" - Item 403.

Asphalt Concrete Base Type 1A-3" - Item 403.07

Select Granular Subgrade 8" - Item 304.01

(8) Cost of regrading channel downstream of dam to be
in prices bid for other items of work. No separate
will be made for this work.

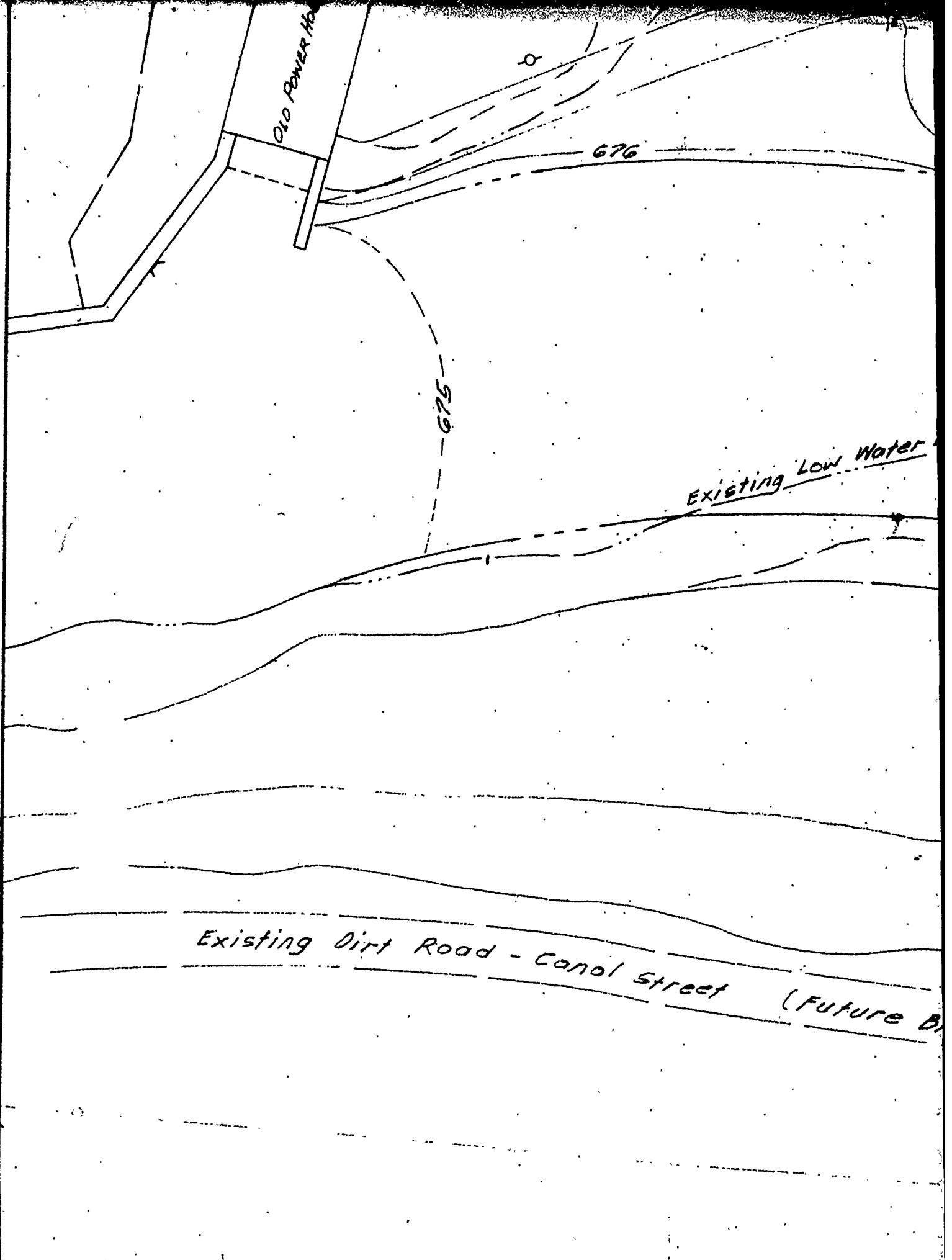


4

blish

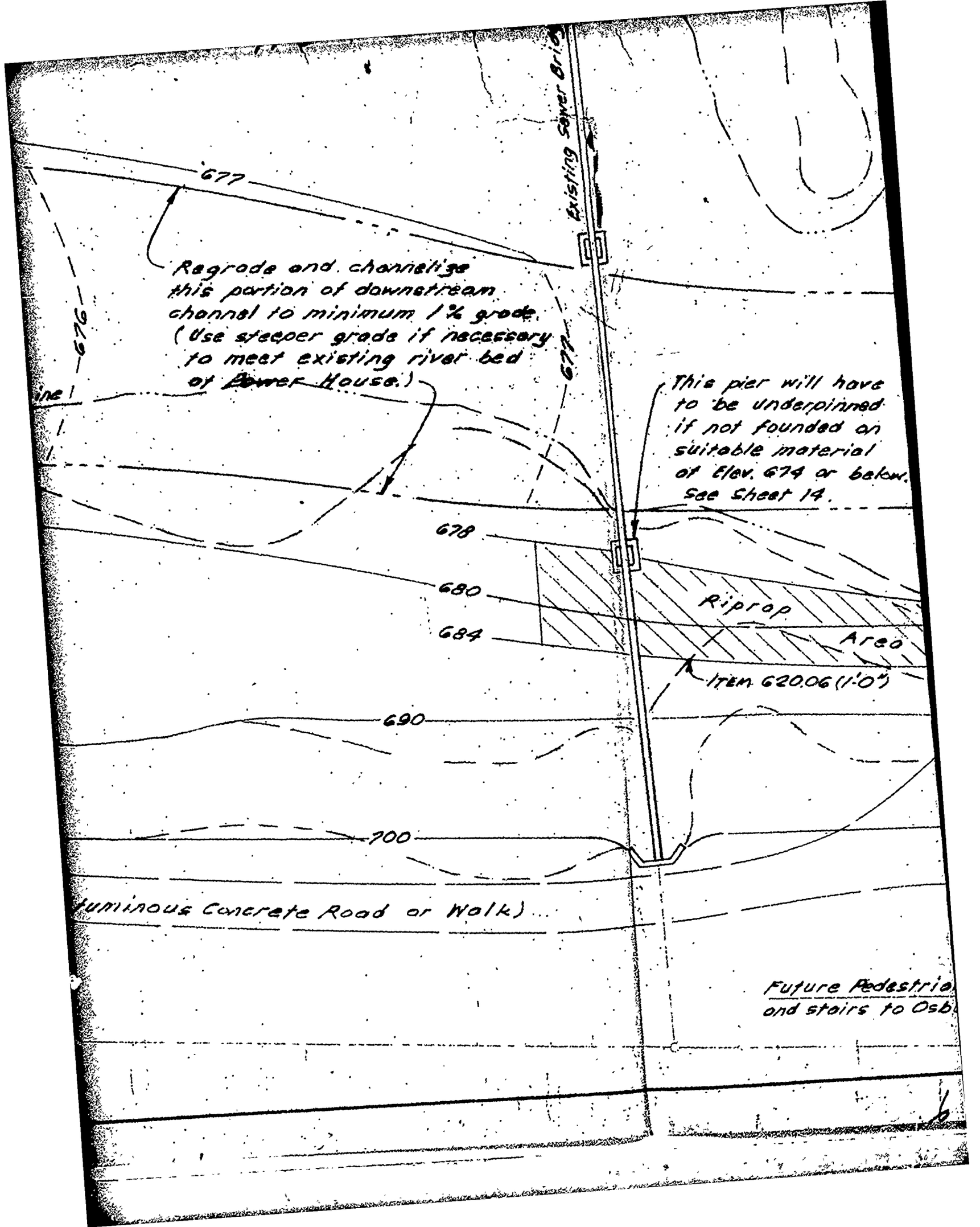
ent

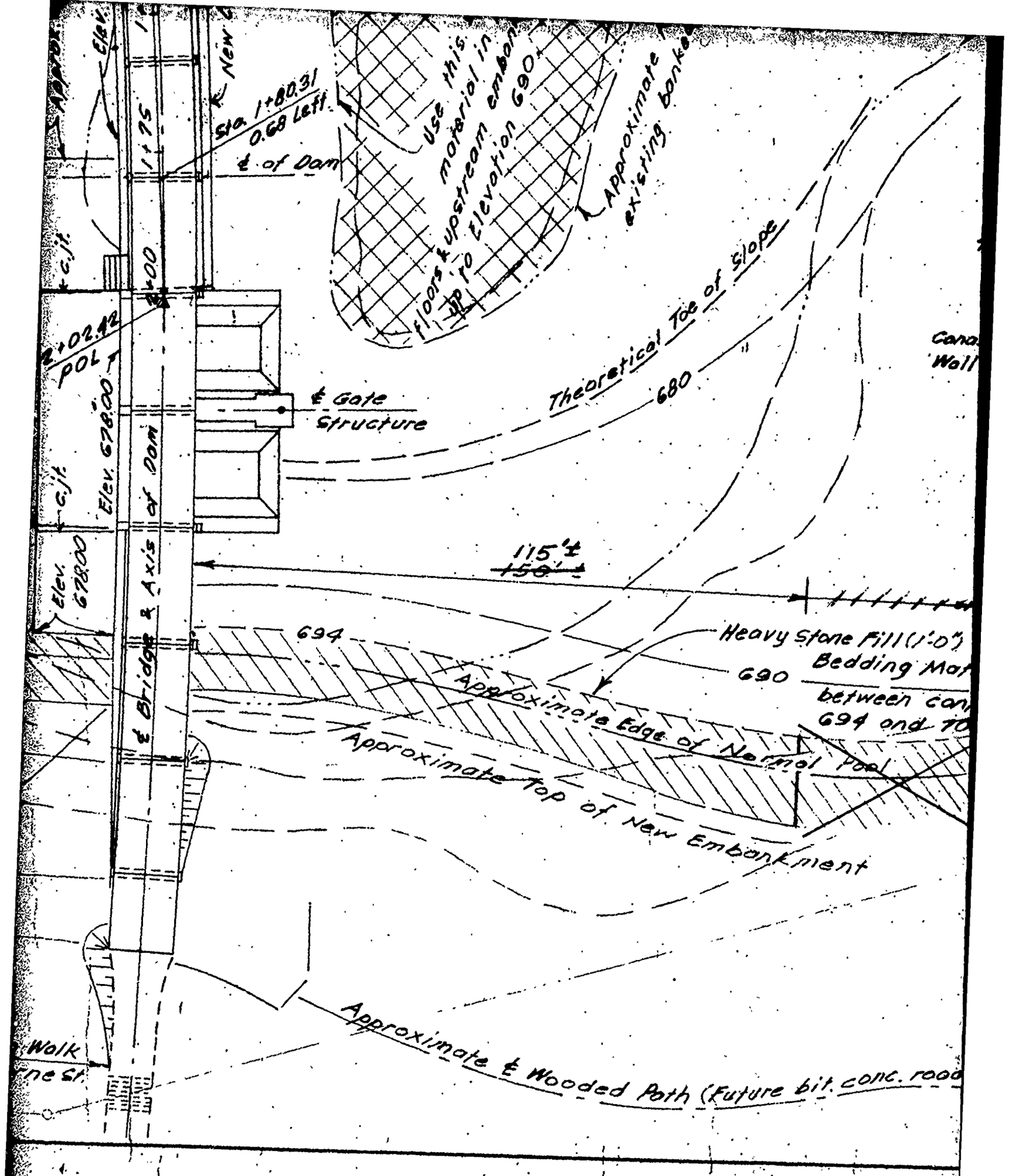
to



SRI Ac/LAN 9/13/77

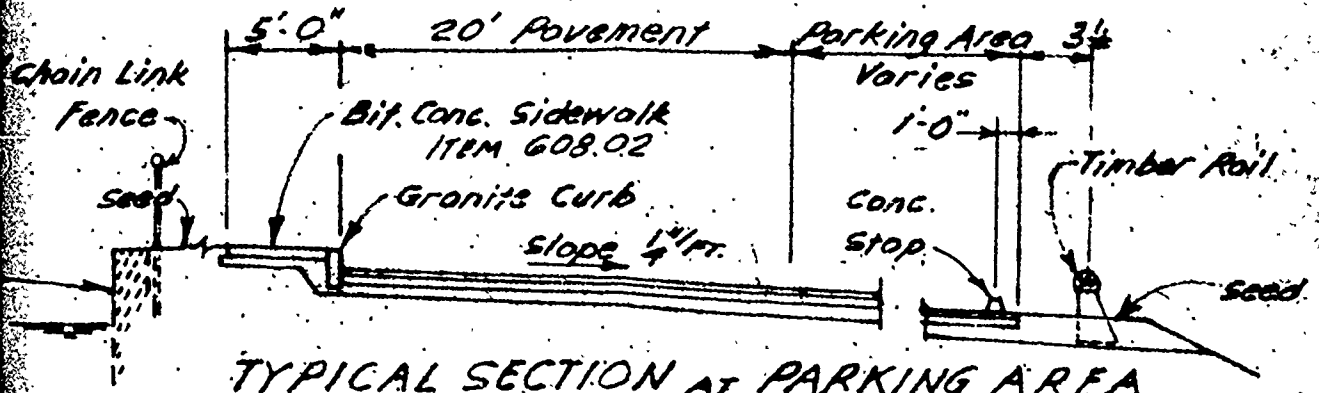
N3878


677
Existing Sewer Bri
Regrade and channelize this portion of downstream channel to minimum 1% grade. (Use steeper grade if necessary to meet existing river bed at Power House.)
676
677
This pier will have to be underpinned if not founded on suitable material at Elev. 674 or below. See Sheet 14.
678
680
684
Riprap Area
Item 620.06 (1'-0")
690
700
(Luminous Concrete Road or Walk)
Future Pedestria
and stairs to Osb


Approx. Elev.
New
Sta. 1+80.31
0.68 Left
1+75
℄ of Dam
Use this material in upstream embankment floors & up to elevation 690
Approximate existing bank
c.j.
+00
2+02.42
POL T
Theoretical Toe of Slope
Canal Wall
℄ Gate Structure
680
Elev. 678.00
c.j.
Elev. 678.00
℄ Bridge & Axis of Dam
115'±
~~150'±~~
694
Heavy Stone Fill (1'-0") Bedding Mat
690
between can
694 and TO
Approximate Edge of Normal Pool
Approximate Top of New Embankment
Walk
ne St.
Approximate ℄ Wooded Path (Future bit. conc. road

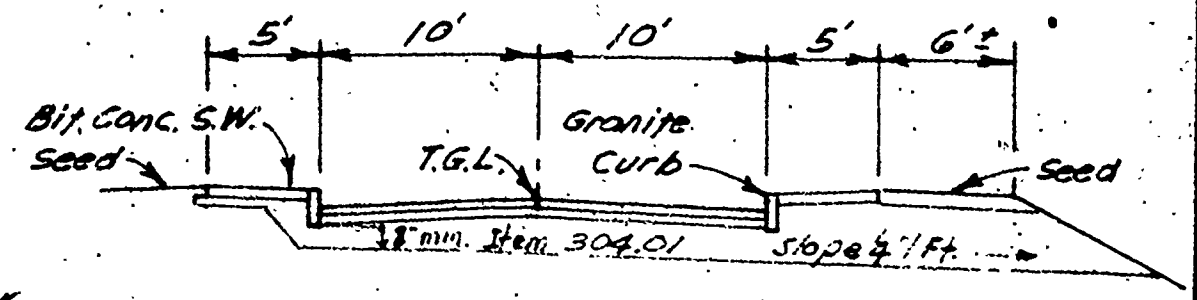
PAVEMENT ITEMS

Scale: 1" = 1'-0"



TYPICAL SECTION AT PARKING AREA

Scale: ⅛" = 1'-0"



TYPICAL SECTION NORTH OF BRIDGE

Scale: ⅛" = 1'-0" (N.T.S.)

AS BUILT

REV.	DATE	DESCRIPTION	BY	CK.

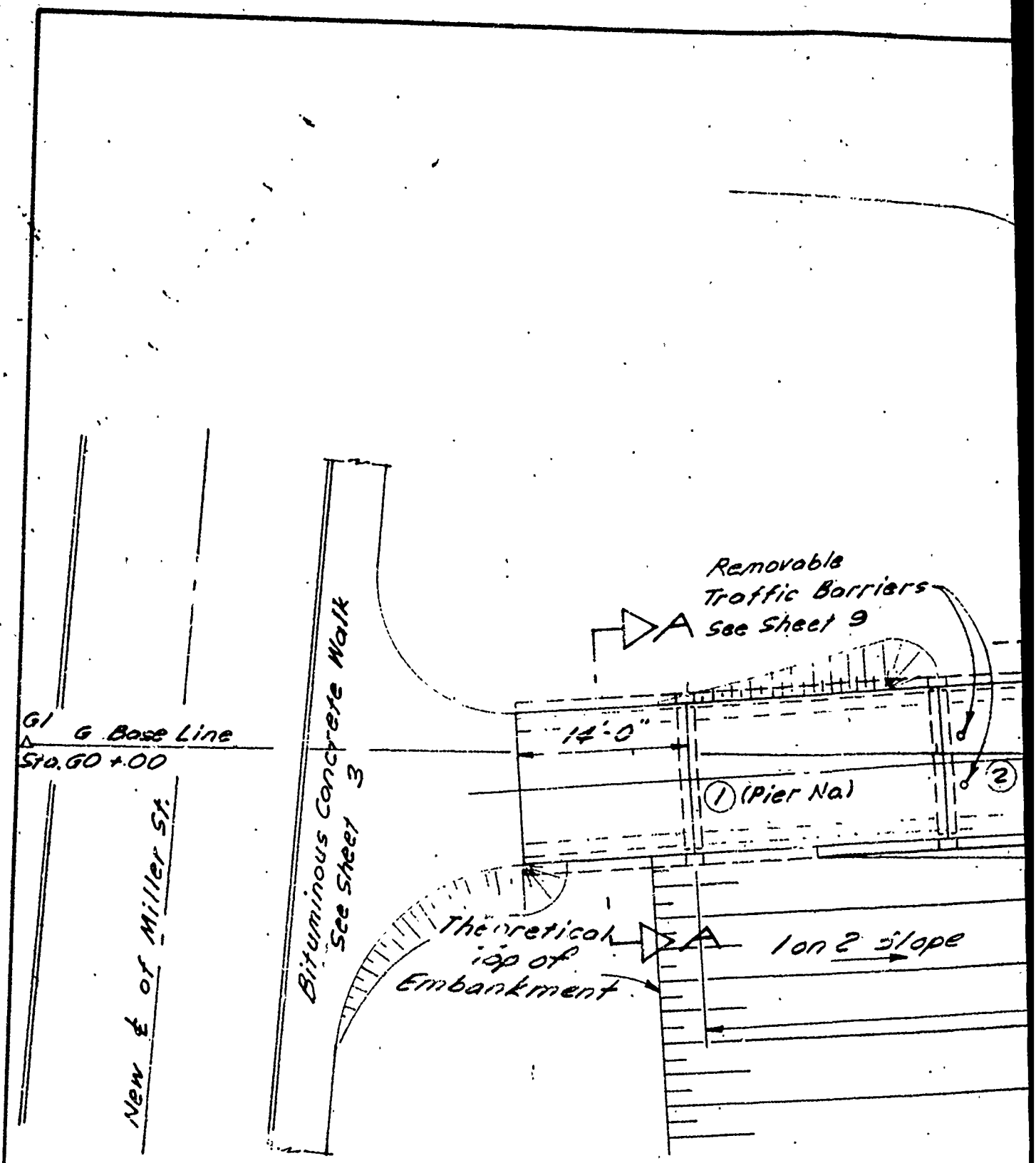
CITY OF AUBURN, N.Y.
RENOVATION OF MILL STREET DAM
CONTRACT NO. 2

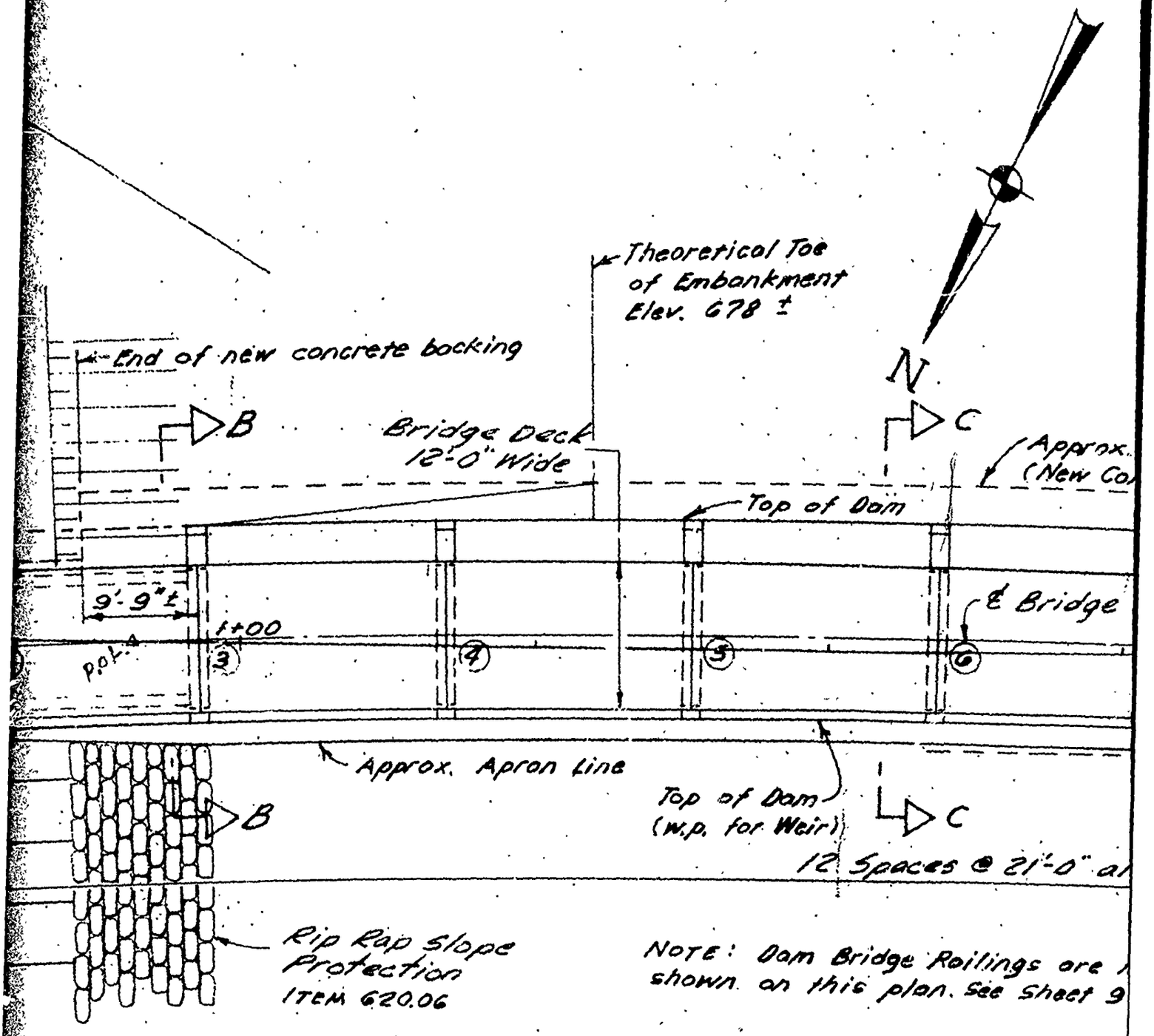
SITE PLAN

KONSKI ENGINEERS, P.C.

SYRACUSE NEW YORK

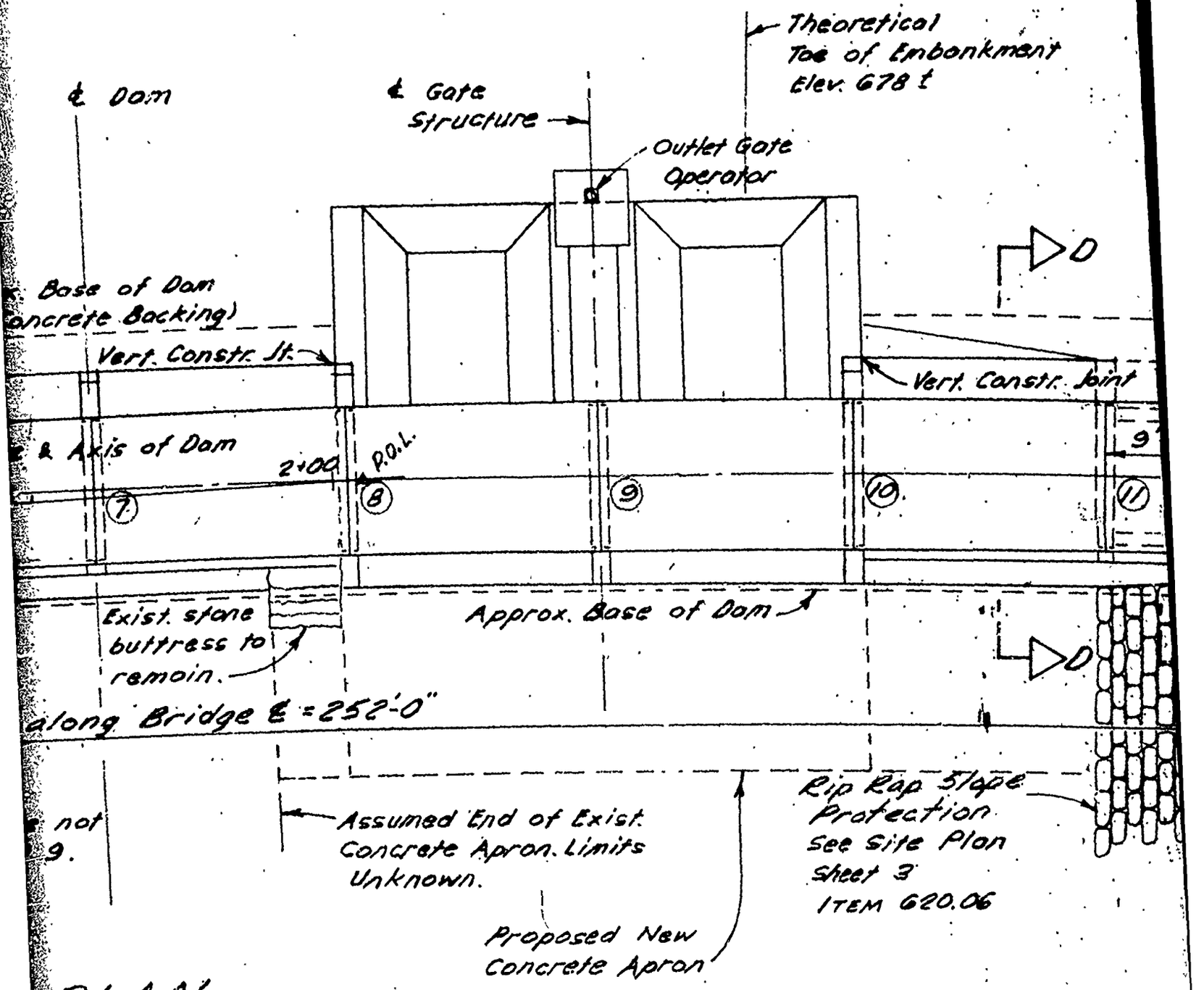
MADE BY	CHECKED BY	SCALE	DATE	DRAWING NO.	SHEET
WFC/Ac	[illegible]	1" = 20' And As Noted	8-16-76	7240F2-S1	3


Removable
Traffic Barriers
See Sheet 9
A
G1
G Base Line
Sta. 60 + 00
14'-0"
1 (Pier No)
2
New ℄ of Miller St.
Bituminous Concrete Walk
See Sheet 3
Theoretical
top of
Embankment
A
1 on 2 slope



Scal

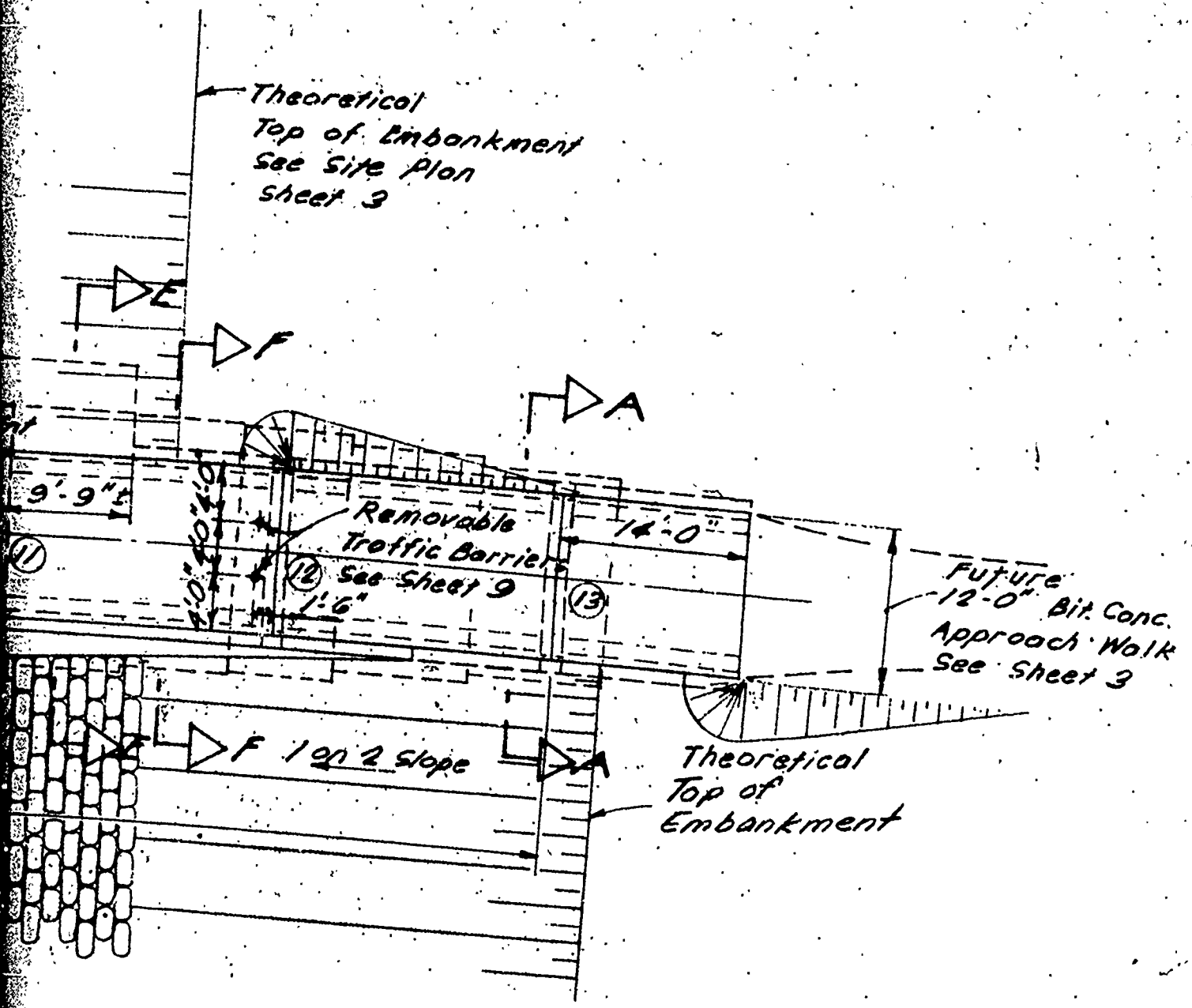
(For Sections A-A thr

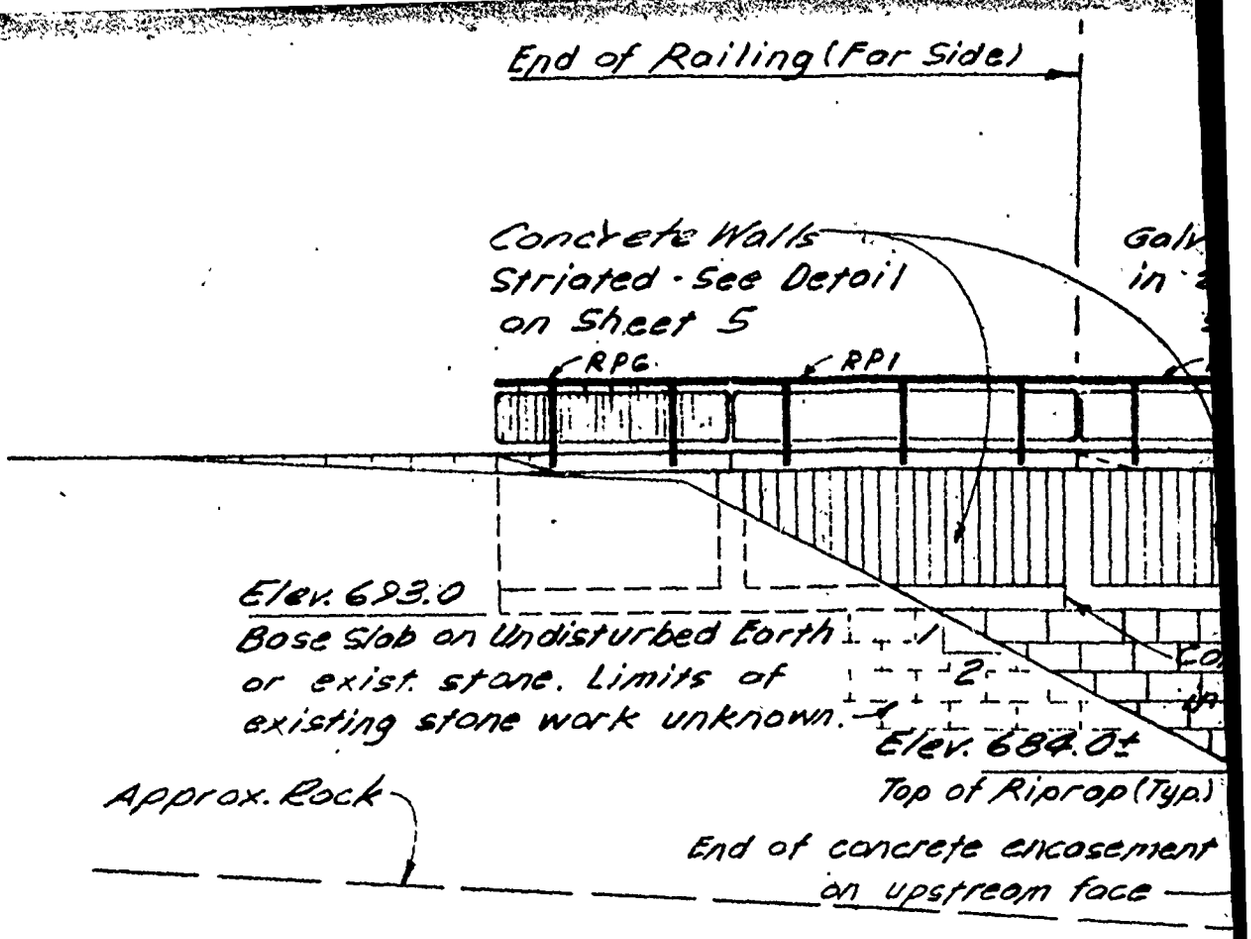


PLAN

ale: 3/32" = 1'-0"

hru F-F See Sheet 5)

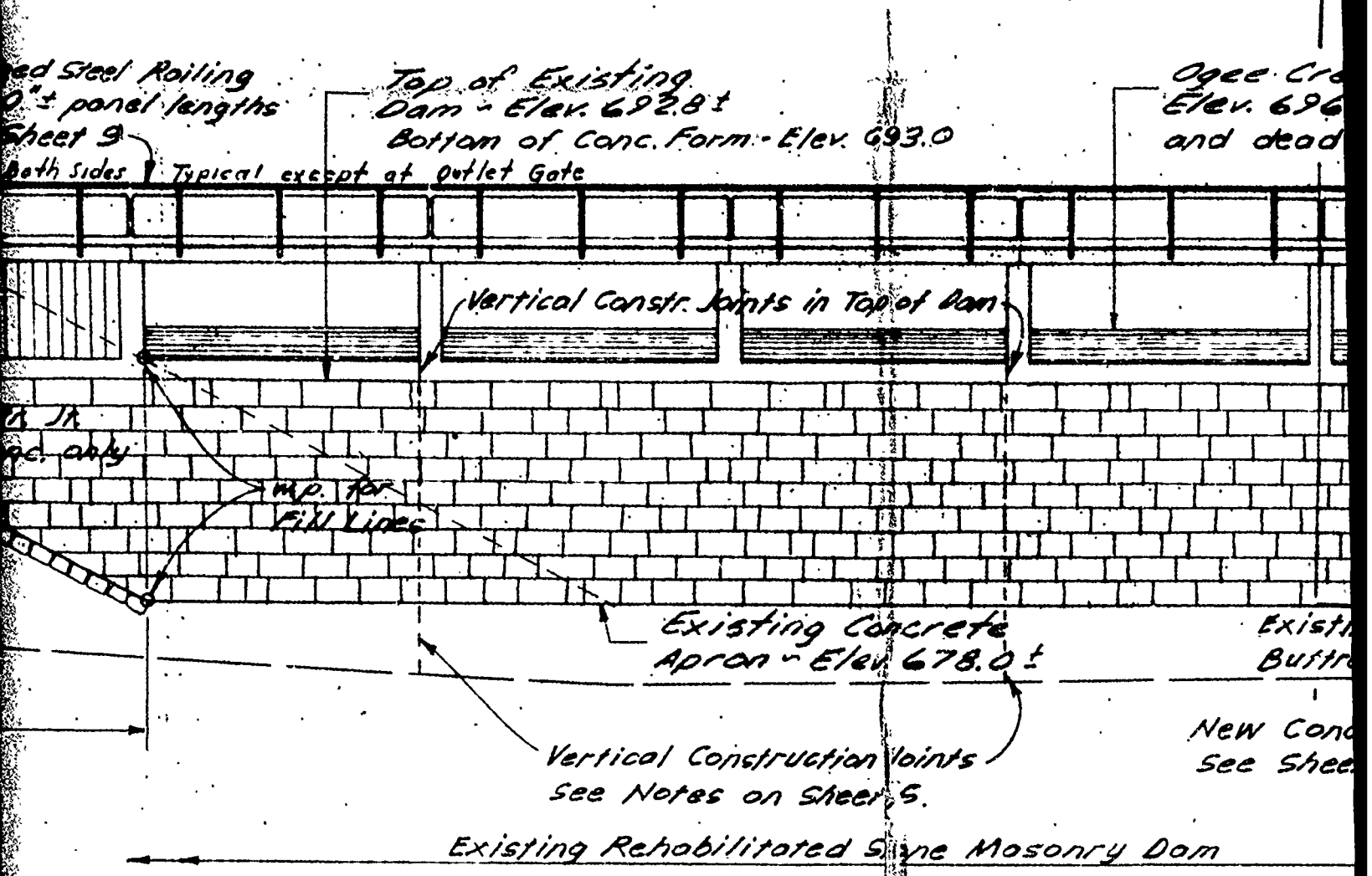

Theoretical
Top of Embankment
See Site Plan
Sheet 3
E
F
A
9'-9"
4'-0"
4'-0"
Removable
Traffic Barrier
See Sheet 9
1'-6"
11
12
13
14'-0"
Future
12'-0" Bit. Conc.
Approach Walk
See Sheet 3
F 1 on 2 Slope
A
Theoretical
Top of
Embankment



SR2 9/21/77
SR1 9/13/77

5

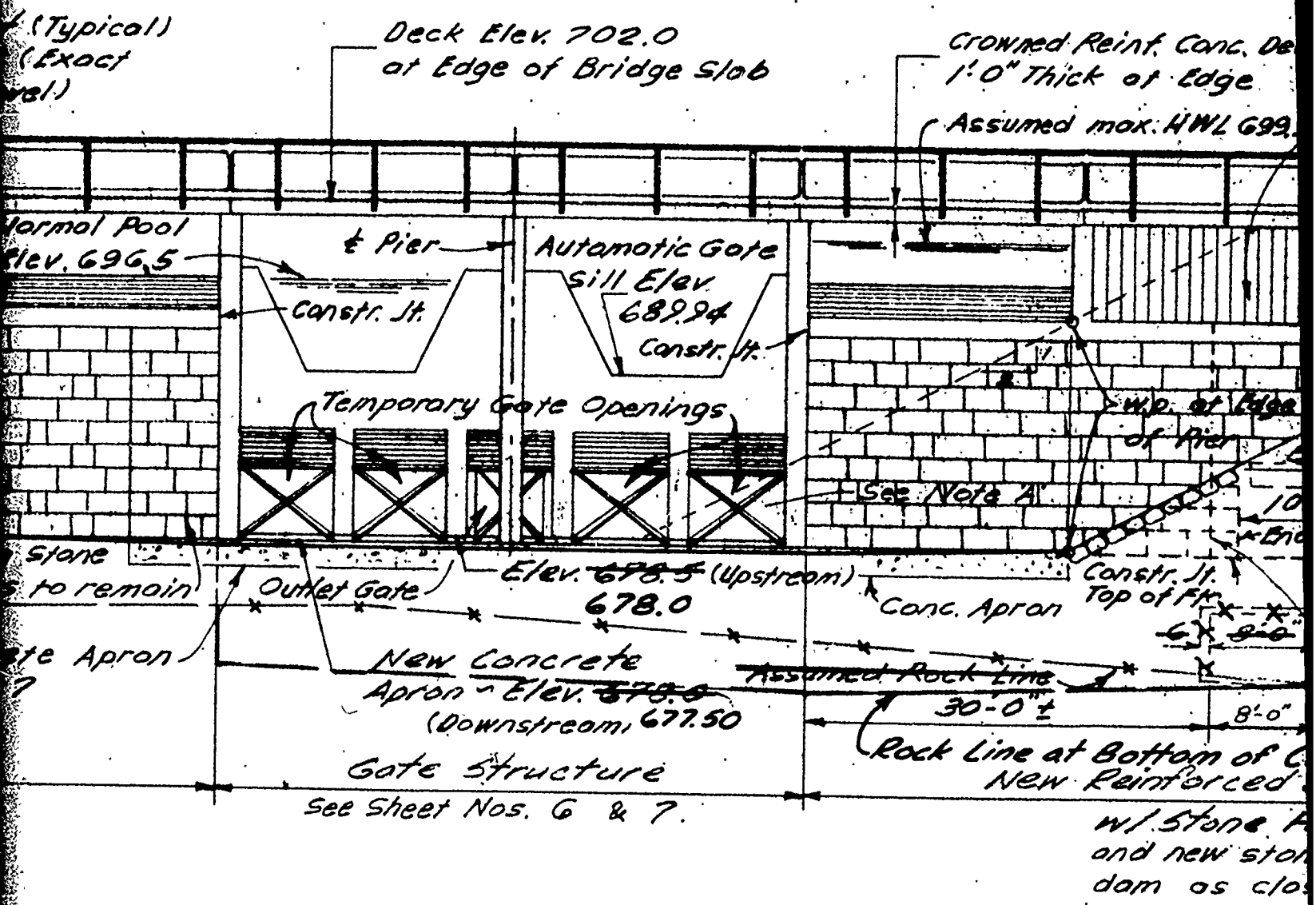
N3878



DEVELOPED E

Scale: 3/32" =

(NOTE: All longitudinal dimensions a



EVATION

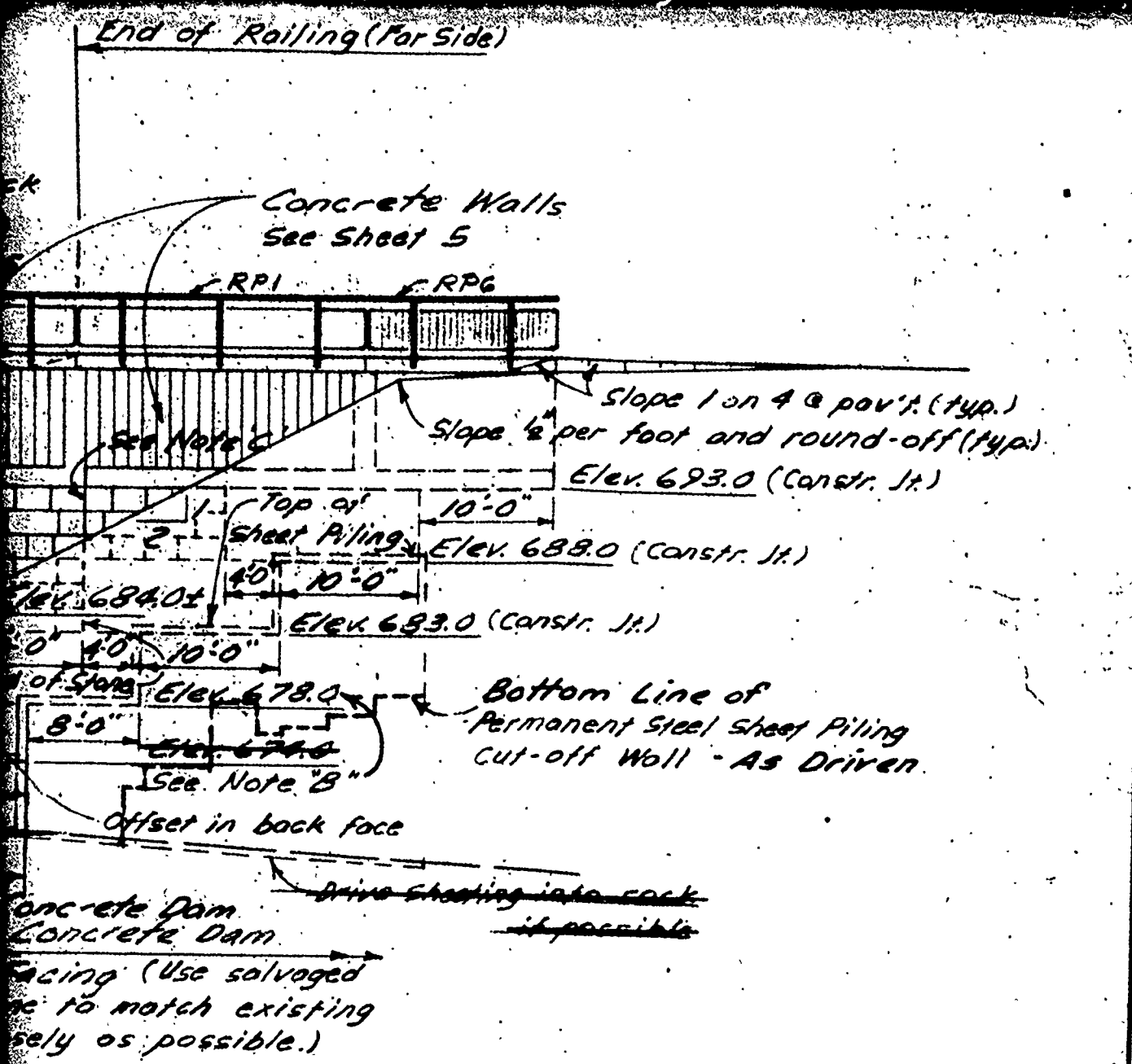
0"

referenced to axis of dam)

NOTE 'A' Toe of upstream embankment to be finished after west temporary gate openings are closed.

NOTE 'B' Bottoms of all footings to be founded on rock or undisturbed earth.

NOTE 'C' Provide vertical construction joint in dam concrete to Elev. 682.0 and vertical control joint in stone masonry. Continue vertical Construction Joint through concrete top of Dam.



AS BUILT

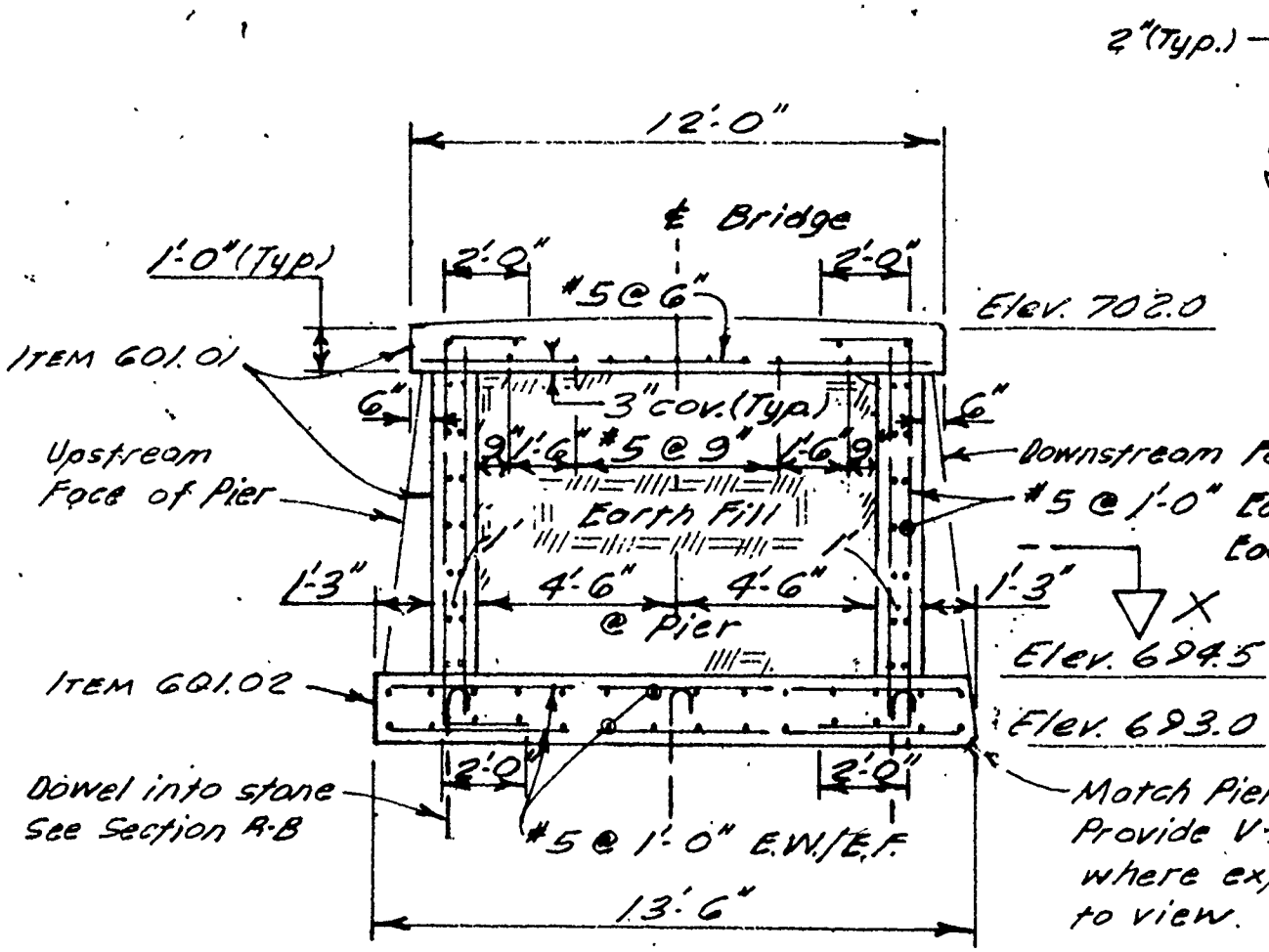
REV.	DATE	DESCRIPTION	BY	CK.

CITY OF AUBURN, N.Y.
RENOVATION OF MILL STREET DAM
CONTRACT NO. 2

PLAN AND ELEVATION OF DAM

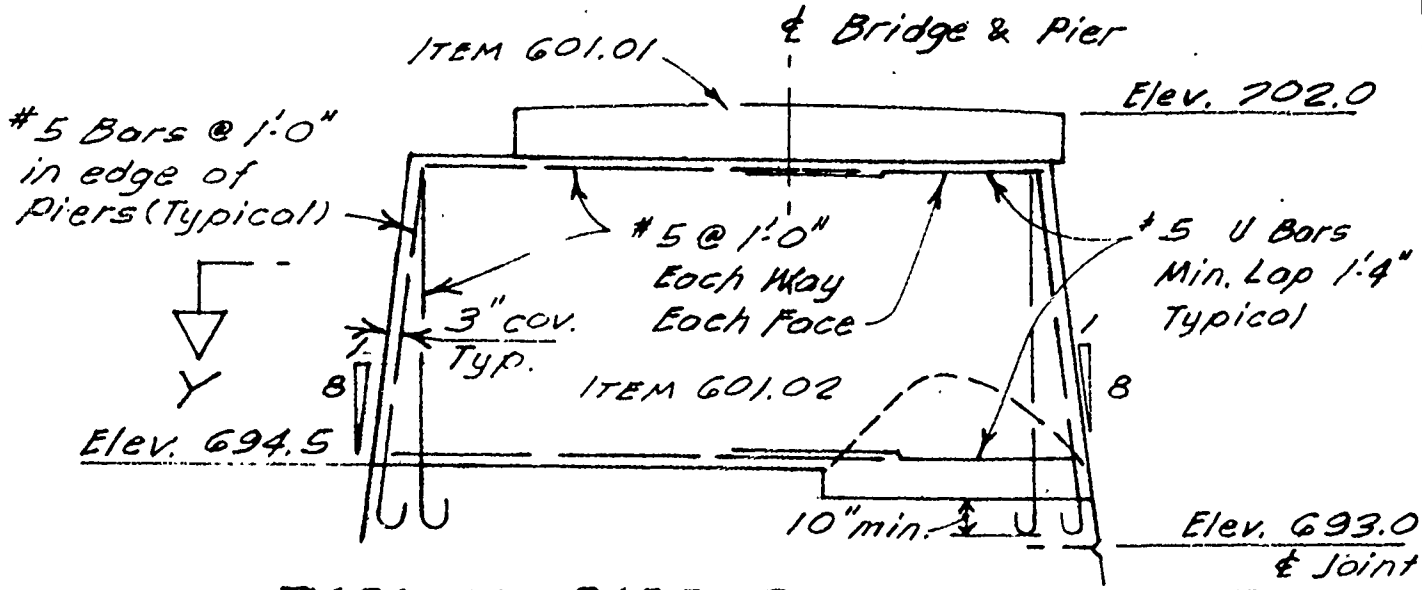
KONSKI ENGINEERS, P.C.
SYRACUSE NEW YORK

MADE BY	CHECKED BY	SCALE	DATE	DRAWING NO.	SHEET
WFC/Ac		As Noted	8-16-76	7240F2-S2	4



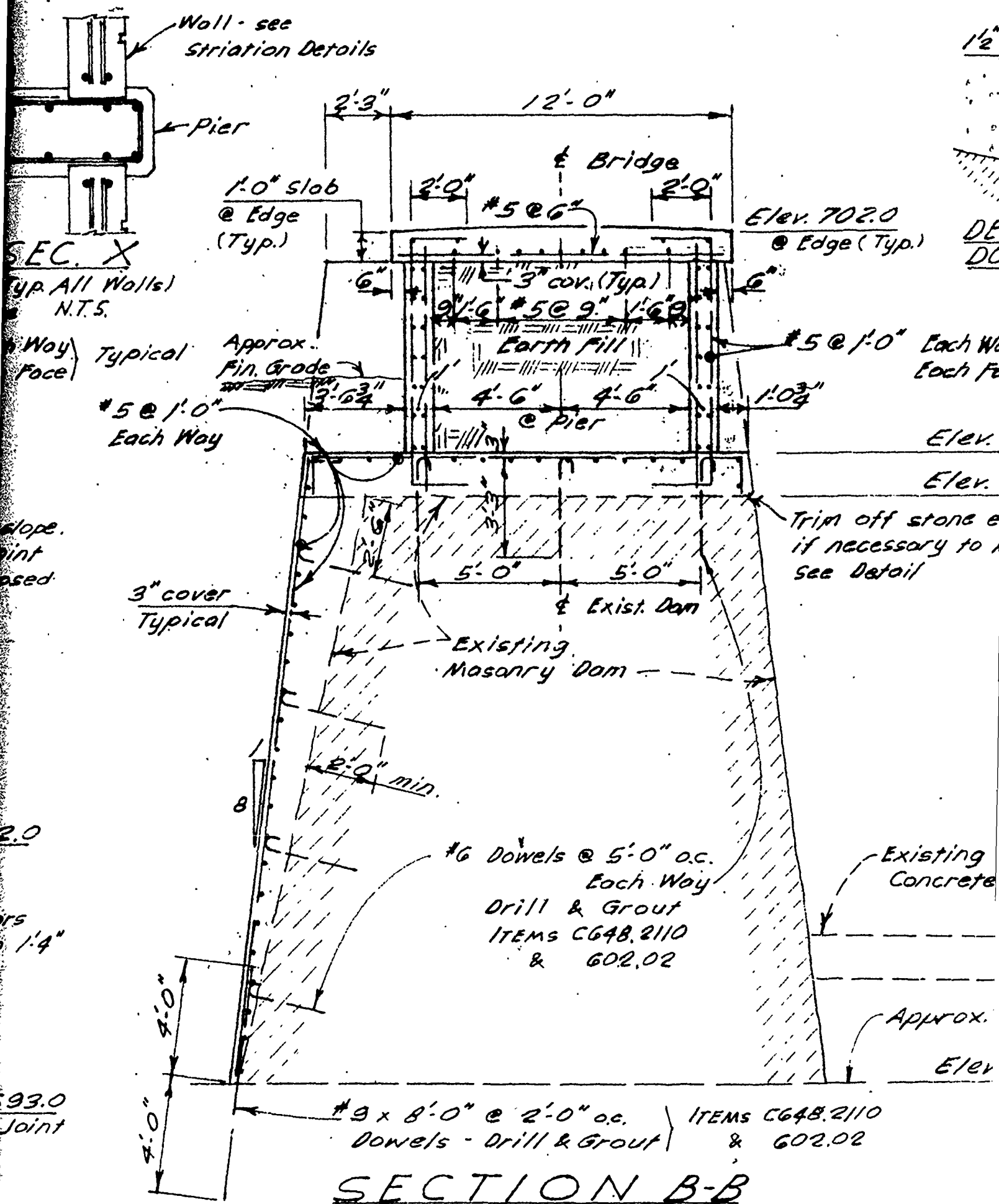
SECTION A-A

Scale: 1/4" = 1'-0"



TYPICAL PIER REINFORCEMENT

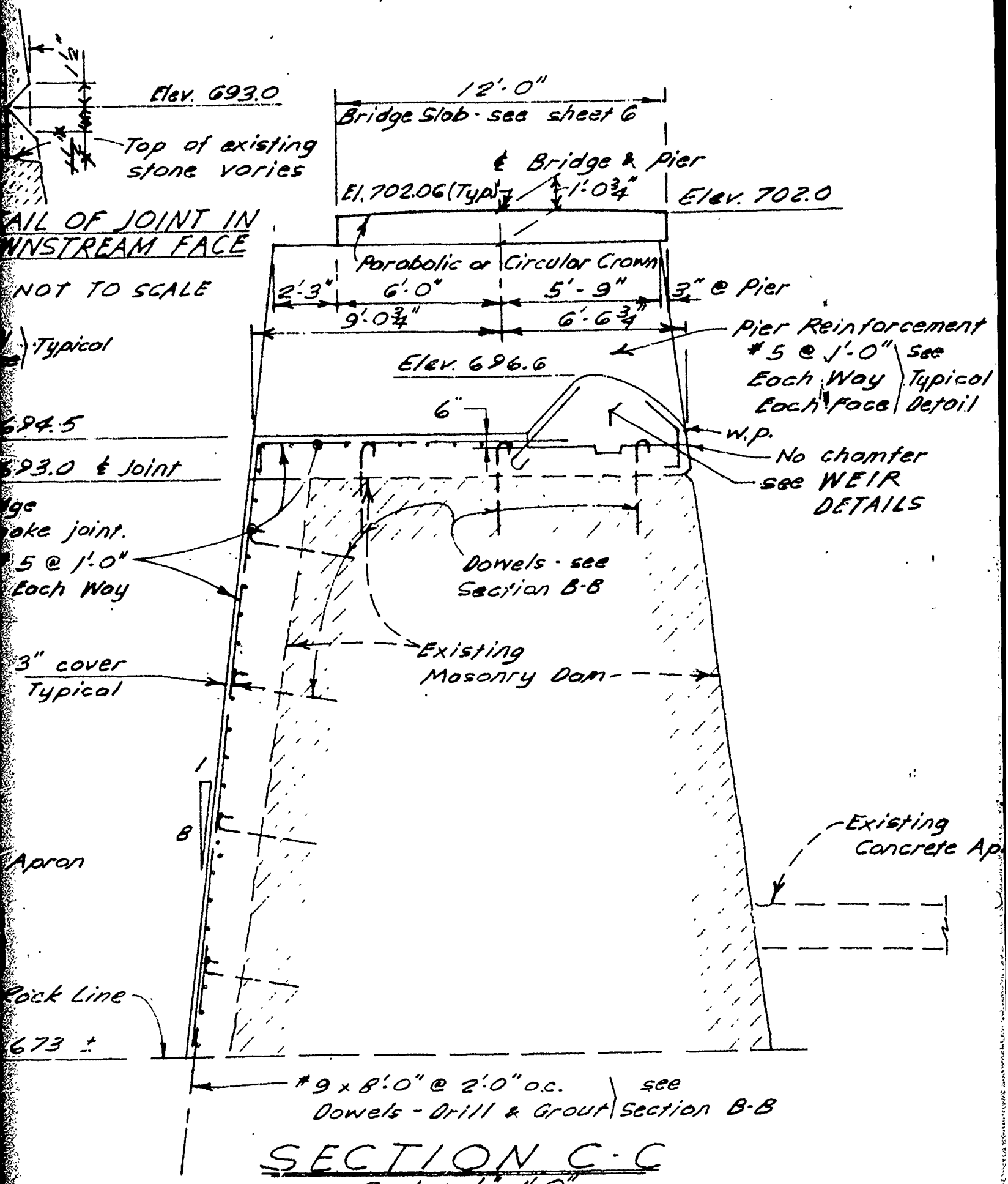
Scale: 1/4" = 1'-0"



SECTION B-B

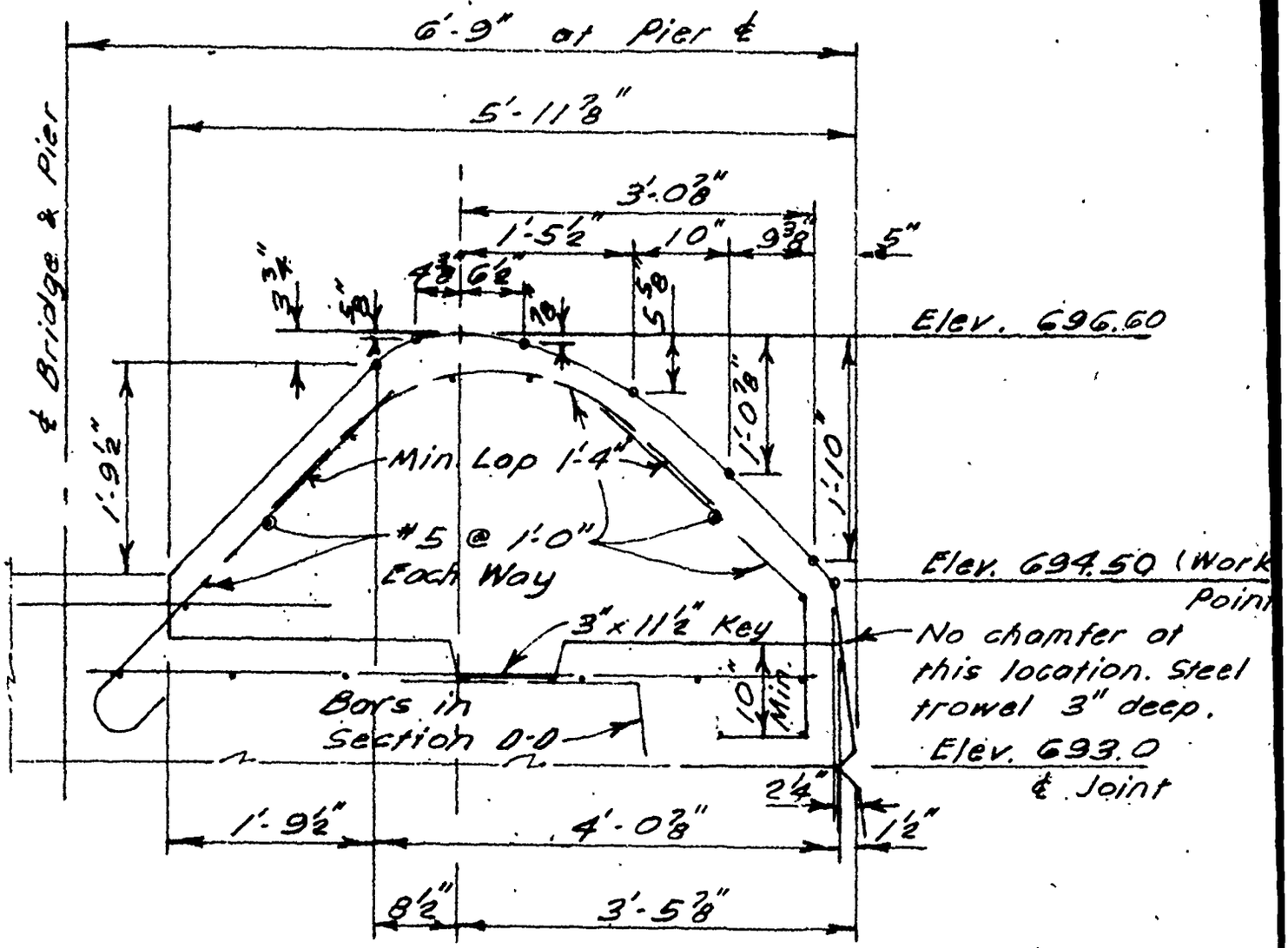
Scale: ¼" = 1'-0"

1



SECTION C-C

Scale: ¼" = 1'-0"



ITEM 601.02

WEIR DETAILS

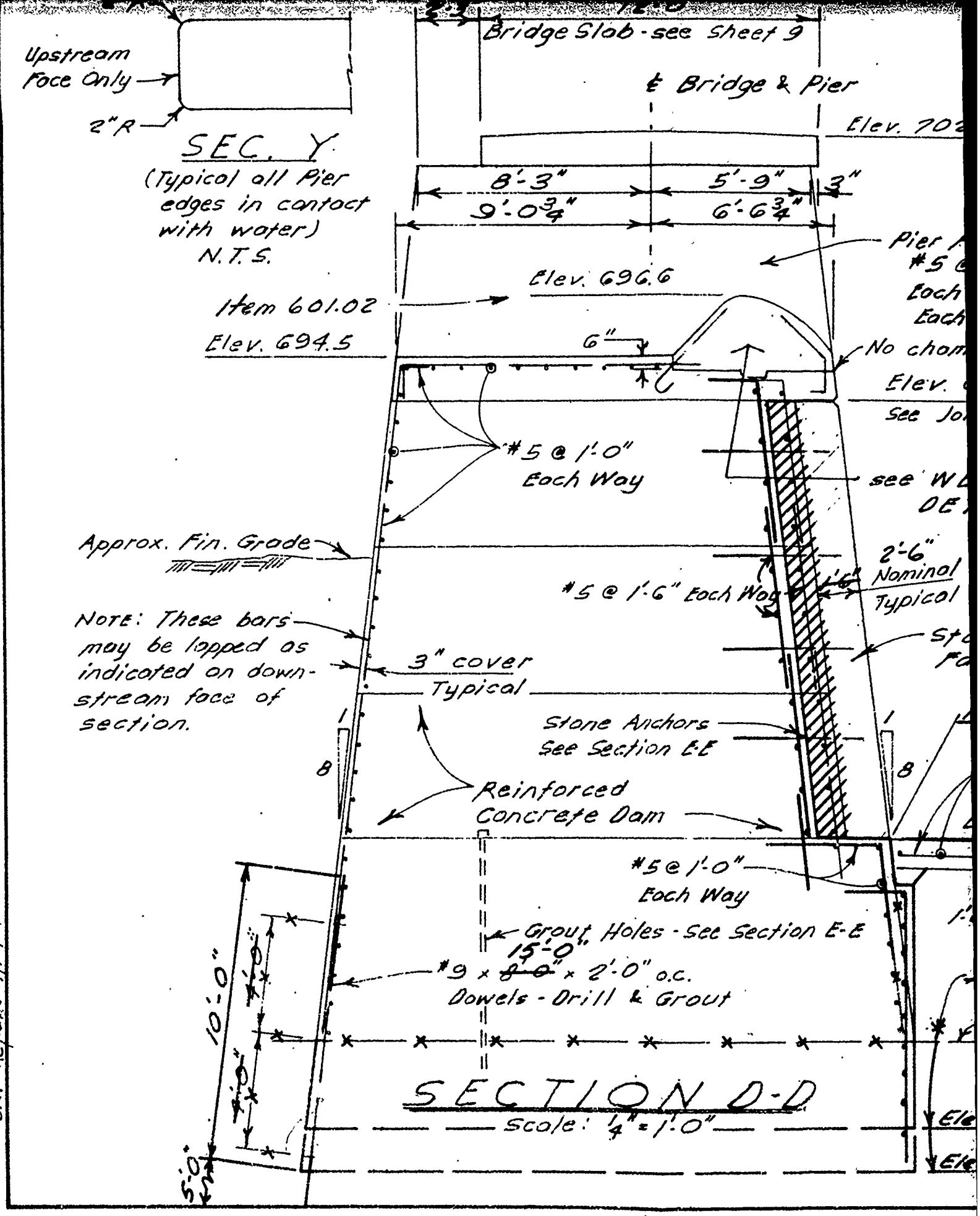
Scale: 3/4" = 1'-0"

NOTES

The bottom of footing is on approximate bedrock where so indicated. Where sound rock is two (2) feet or less below the given elevation, backfill with Class B concrete. Where sound rock is more than two (2) feet below the given elevation, the Design Engineer shall be so notified and an evaluation of the condition made.

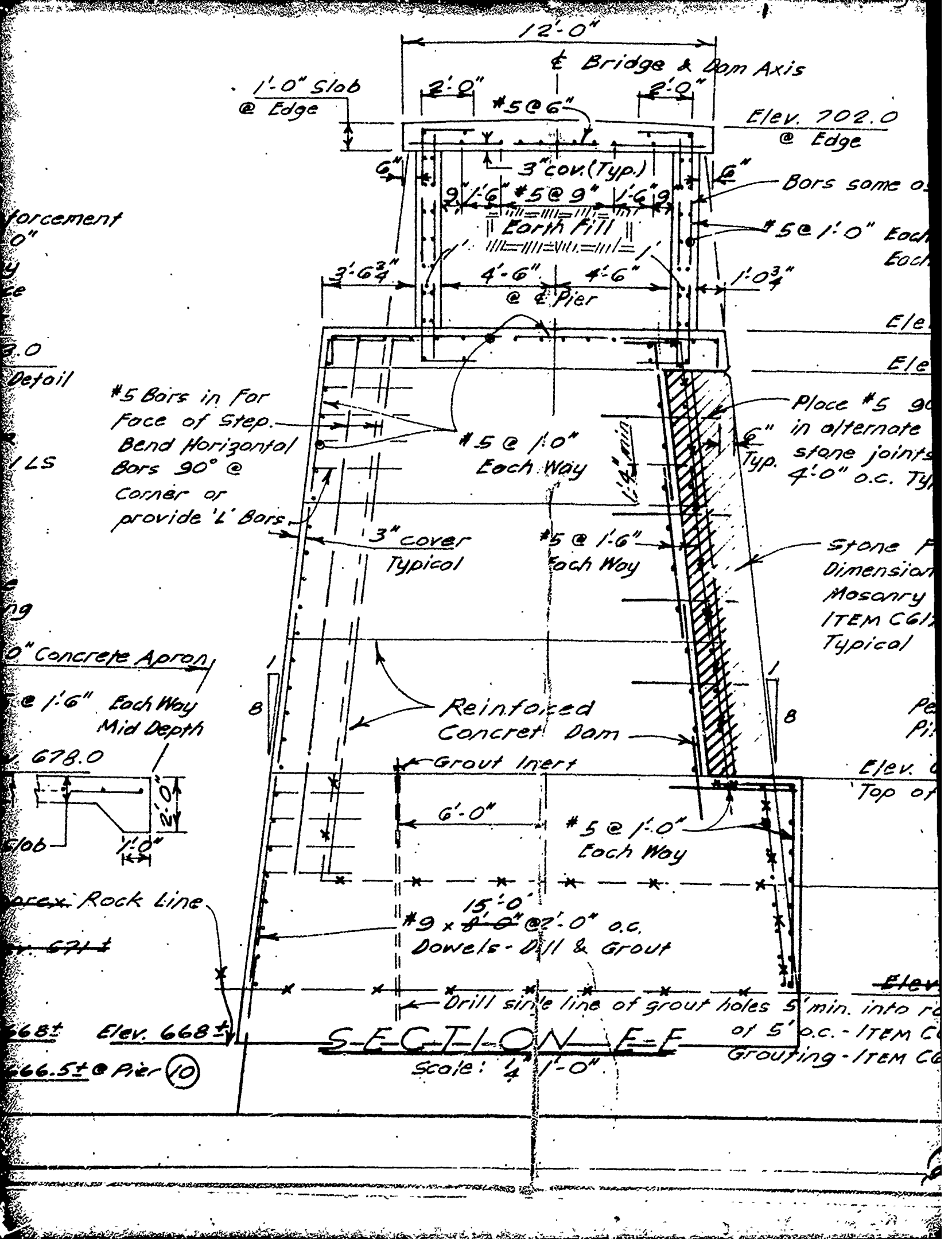
Remove any loose, unsound or fractured material from top of rock and leave surface as rough as possible before pouring concrete.

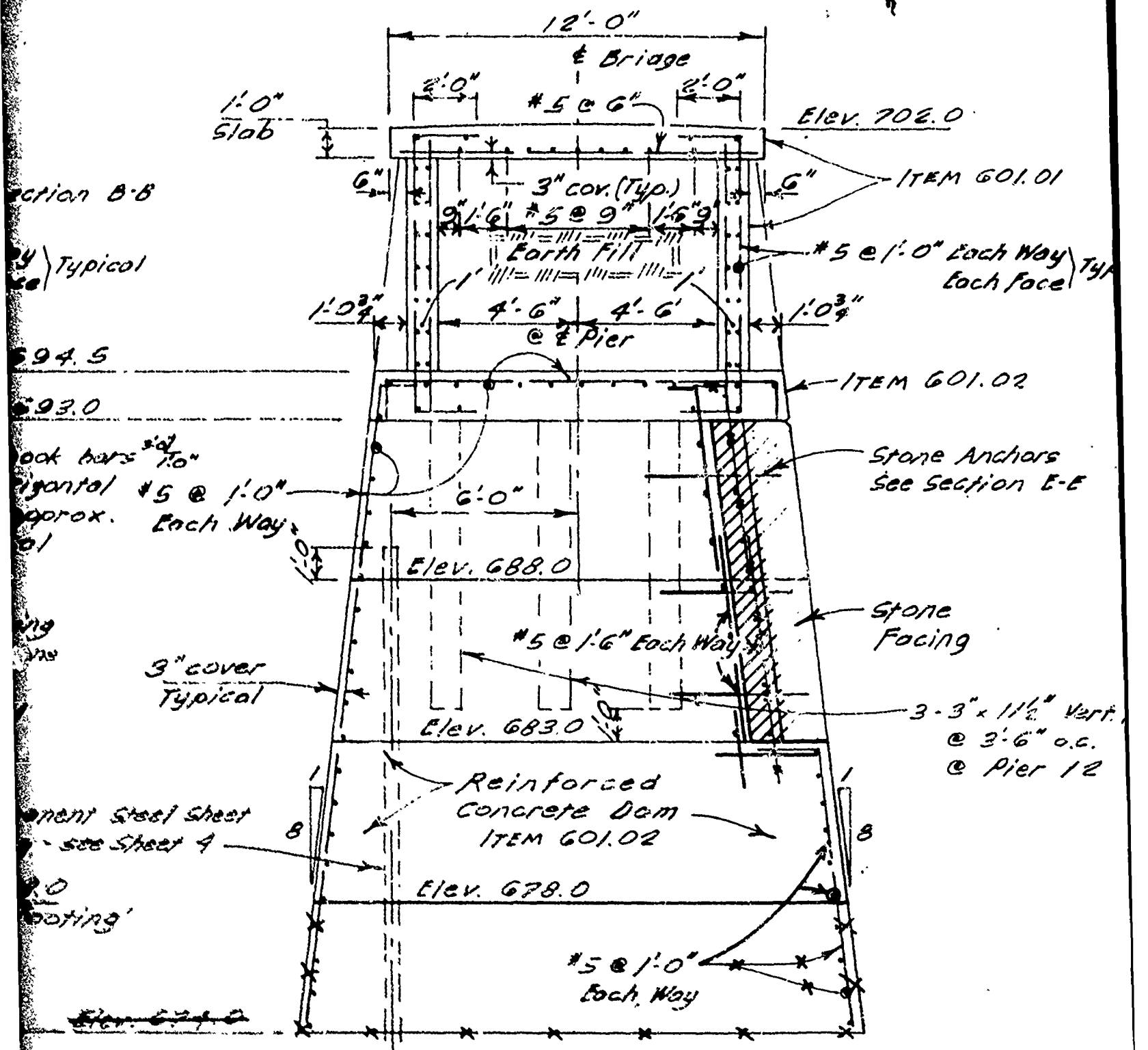
Drill and grout rock through new concrete footing before pouring



SRI Ac/LAS 9/13/77

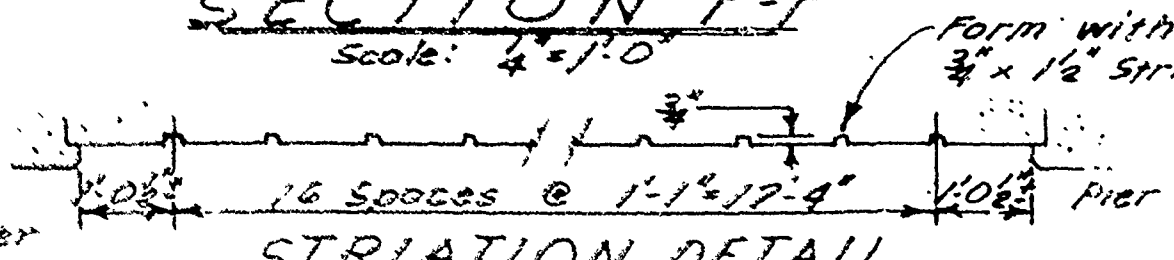
N3878


12'-0"
℄ Bridge & Dam Axis
1'-0" Slab @ Edge
2'-0"
2'-0"
#5 @ 6"
Elev. 702.0 @ Edge
3" cov. (Typ.)
6"
6"
9" 1'-6" #5 @ 9" 1'-6" 9"
Bars some o
Earth Fill
#5 @ 1'-0" Each
3'-6¾"
4'-6"
4'-6"
1'-0¾"
@ ℄ Pier
#5 Bars in For Face of Step. Bend Horizontal Bars 90° @ Corner or provide 'L' Bars
#5 @ 1'-0" Each Way
1'-4" min
6" Typ.
Place #5 90 in alternate stone joints 4'-0" o.c. Typ
3" cover Typical
#5 @ 1'-6" Each Way
Stone F Dimension Masonry ITEM C61 Typical
Reinforced Concrete Dam
Grout Inert
6'-0"
#5 @ 1'-0" Each Way
15'-0"
#9 x ~~8'-0"~~ @ 2'-0" o.c. Dowels - Drill & Grout
Drill single line of grout holes 5' min. into ro of 5' o.c. - ITEM C Grouting - ITEM C
Elev. 668±
SECTION E-E
Scale: ¼" 1'-0"
forcement
0"
y
ce
3.0
Detail
LS
ng
0" Concrete Apron
@ 1'-6" Each Way Mid Depth
678.0
2'-0"
1'-0"
Slab
Rock Line
~~Elev. 671±~~
668±
666.5± @ Pier 10
Elev.
Elev.
Elev. C
Top of



SECTION F-F

Scale: ¼" = 1'-0"



STRIATION DETAIL

NOT TO SCALE

Drill and grout rock through new concrete footing before pouring subsequent lifts.

Concrete encasement on back of existing dam, horizontal lifts of new dam and top slabs on both sections shall be placed in alternate pours between vertical construction joints.

Weirs are to be poured after bridge piers are in place and must be poured to exact elevation and finished dead level.

Concrete in bridge slabs, piers and walls to be Class A. All other concrete to be Class B (Class A Optional). Chamfer all exposed edges of concrete 1" x 1" unless otherwise shown or noted.

Leave tops of horizontal lifts rough, and clean and wash thoroughly with high pressure water before placing next lift.

Place stone facing before pouring lift. Horizontal joints in stone and concrete do not have to match. Stone masonry is not capable of supporting a five-foot lift of concrete as a form and must be braced or tied back.

Stone masonry to match that in existing dam as closely as possible.

AS BUILT

REV.	DATE	DESCRIPTION	BY	CK.

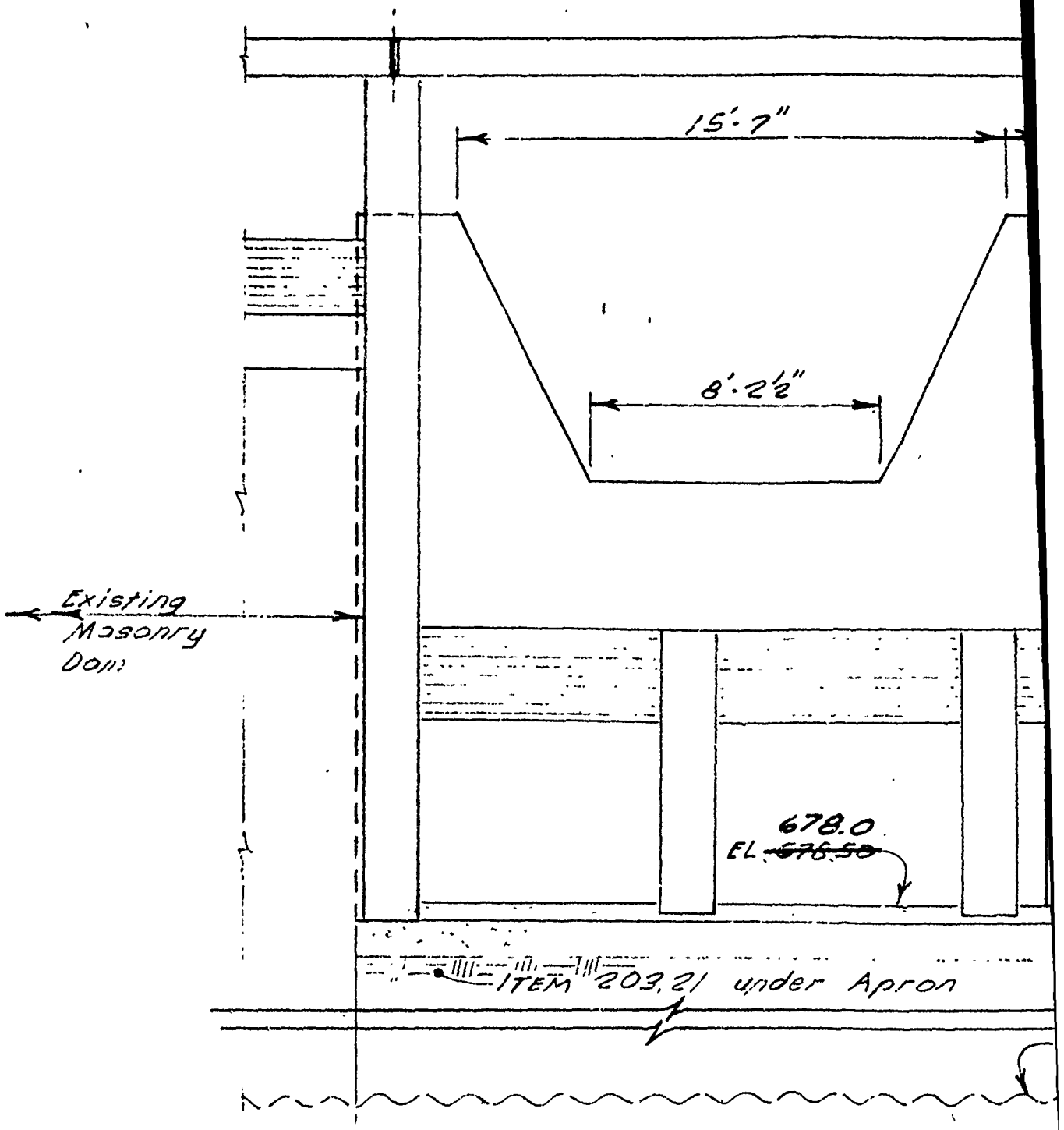
CITY OF AUBURN, N.Y.
RENOVATION OF MILL STREET DAM
CONTRACT NO. 2

TYPICAL SECTIONS - DAM

KONSKI ENGINEERS, P.C.

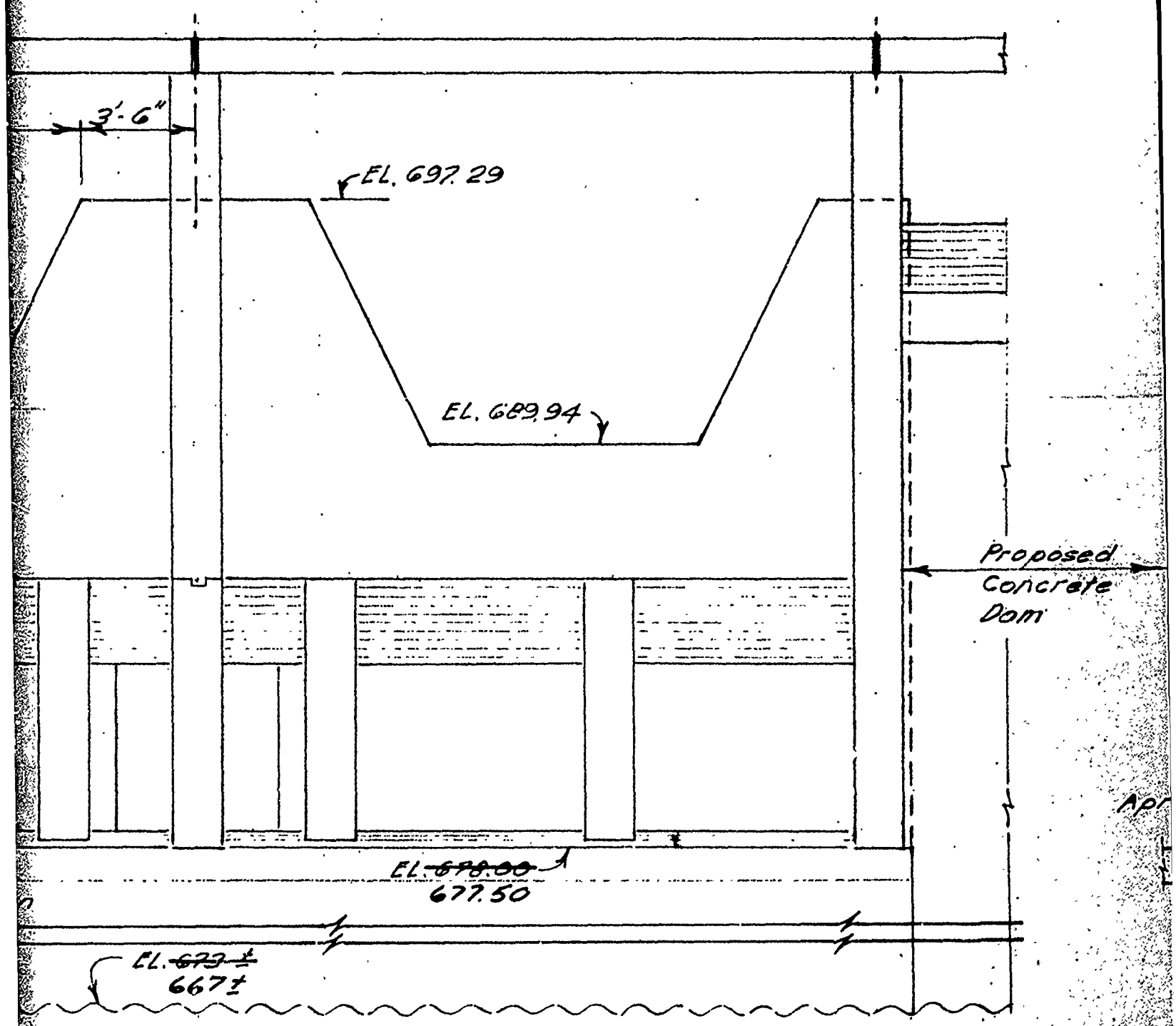
SYRACUSE NEW YORK

MADE BY	CHECKED BY	SCALE	DATE	DRAWING NO.	SHEET
WFC/Ac	JWG	As Noted	8-16-76	7240F2-S3	5



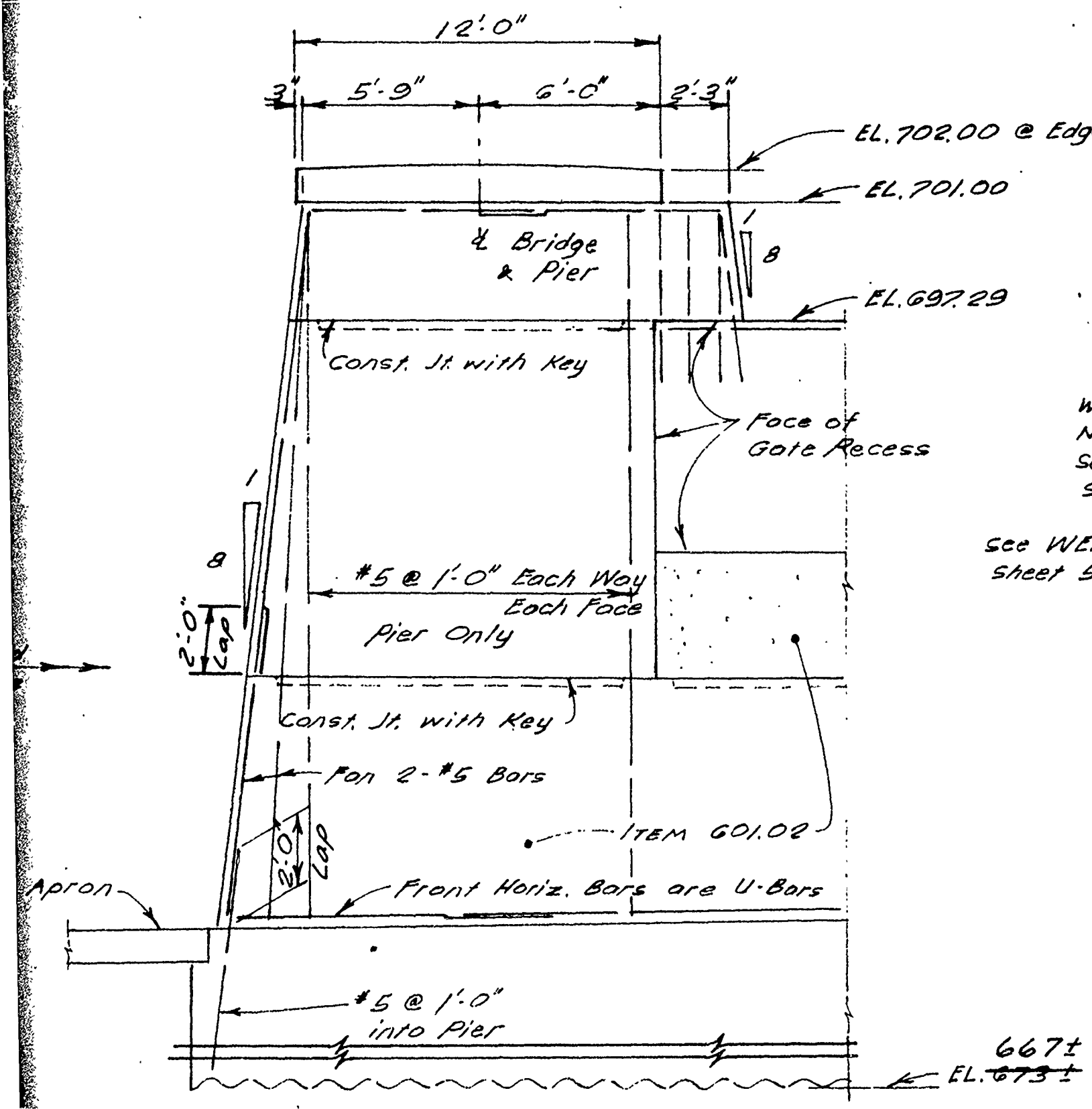
NORTH E

Scale: 1

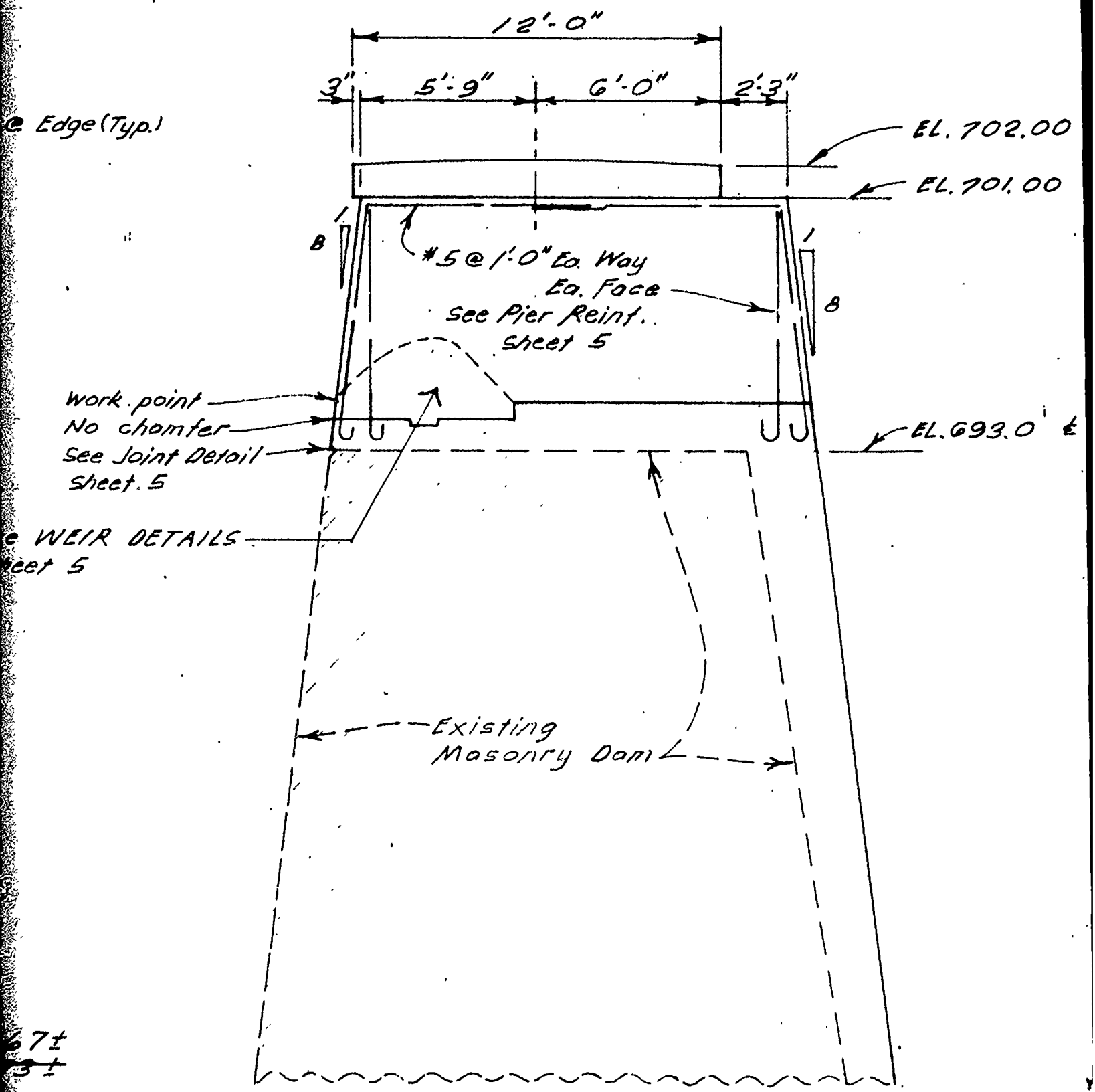


ELEVATION

Scale: 1" = 1'-0"


12'-0"
3"
5'-9"
6'-0"
2'-3"
EL. 702.00 @ Edge
EL. 701.00
℄ Bridge & Pier
1
8
EL. 697.29
Const. Jt. with Key
Face of Gate Recess
see WEI
sheet 5
1
8
#5 @ 1'-0" Each Way Each Face
Pier Only
2'-0" Lap
Const. Jt. with Key
Fan 2-#5 Bars
ITEM 601.02
2'-0" Lap
Apron
Front Horiz. Bars are U-Bars
#5 @ 1'-0" into Pier
667±
EL. ~~673±~~

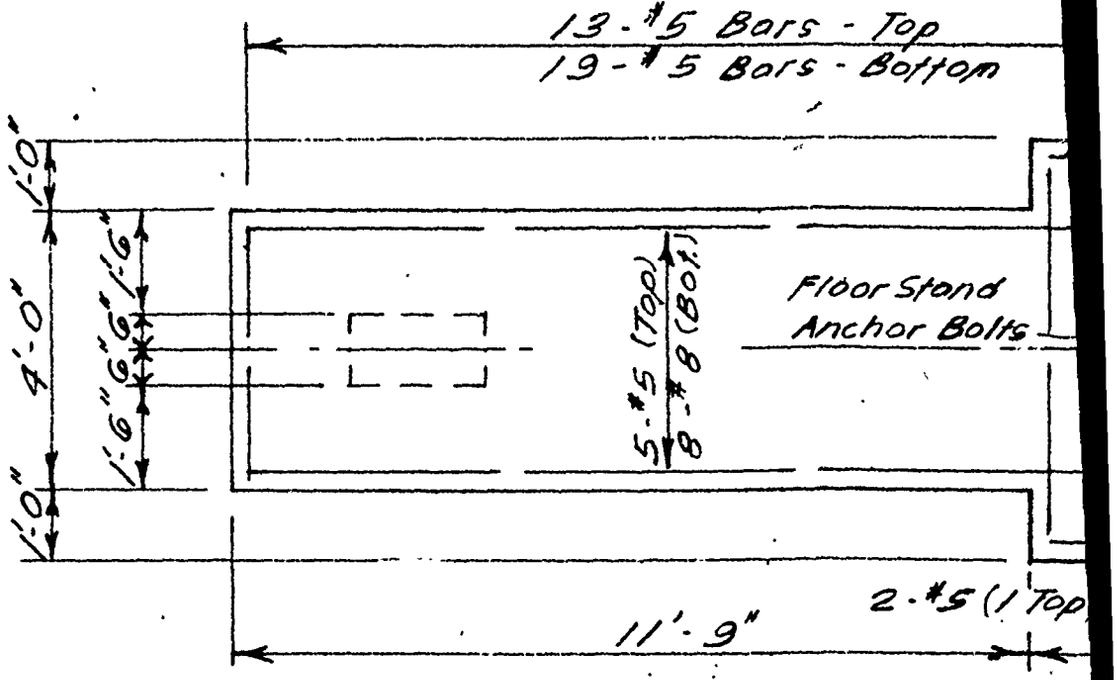
AT GATE


12'-0"
3"
5'-9"
6'-0"
2'-3"
@ Edge (Typ.)
EL. 702.00
EL. 701.00
1
B
#5 @ 1'-0" Ea. Way
Ea. Face
See Pier Reinf.
Sheet 5
1
B
Work point
No chamfer
See Joint Detail
Sheet. 5
EL. 693.0'
e WEIR DETAILS
eet 5
Existing
Masonry Dam
67±
3±

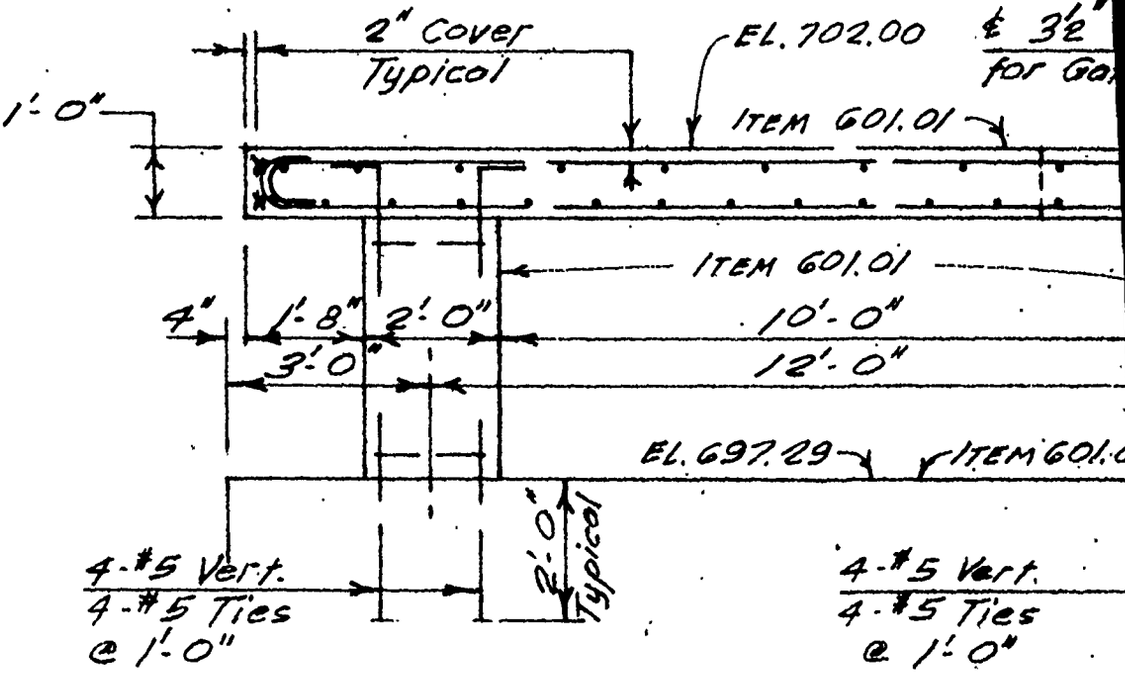
Edge(Typ.)

Joint

Scale



PLAN



SECTION

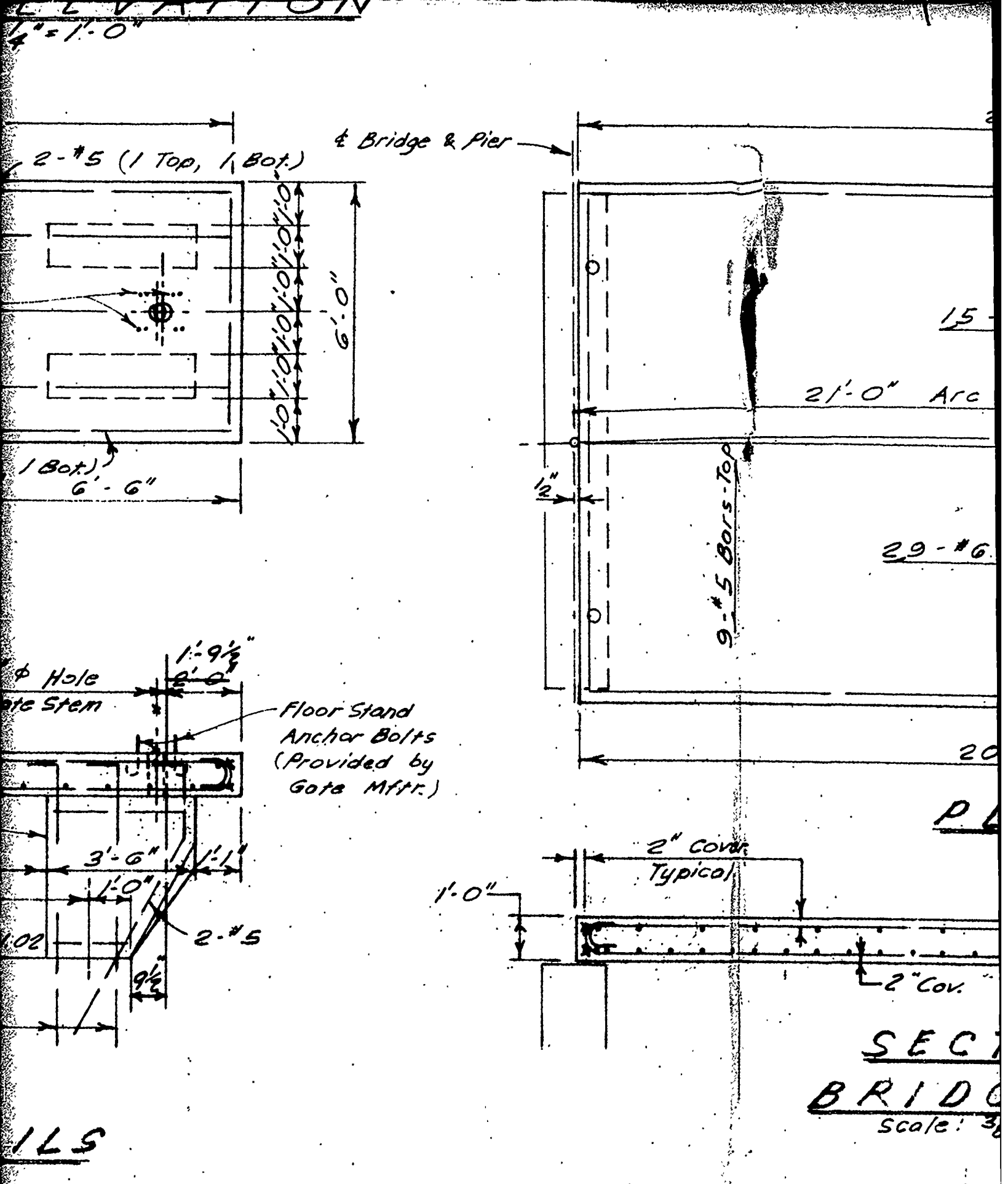
PLATFORM DETA

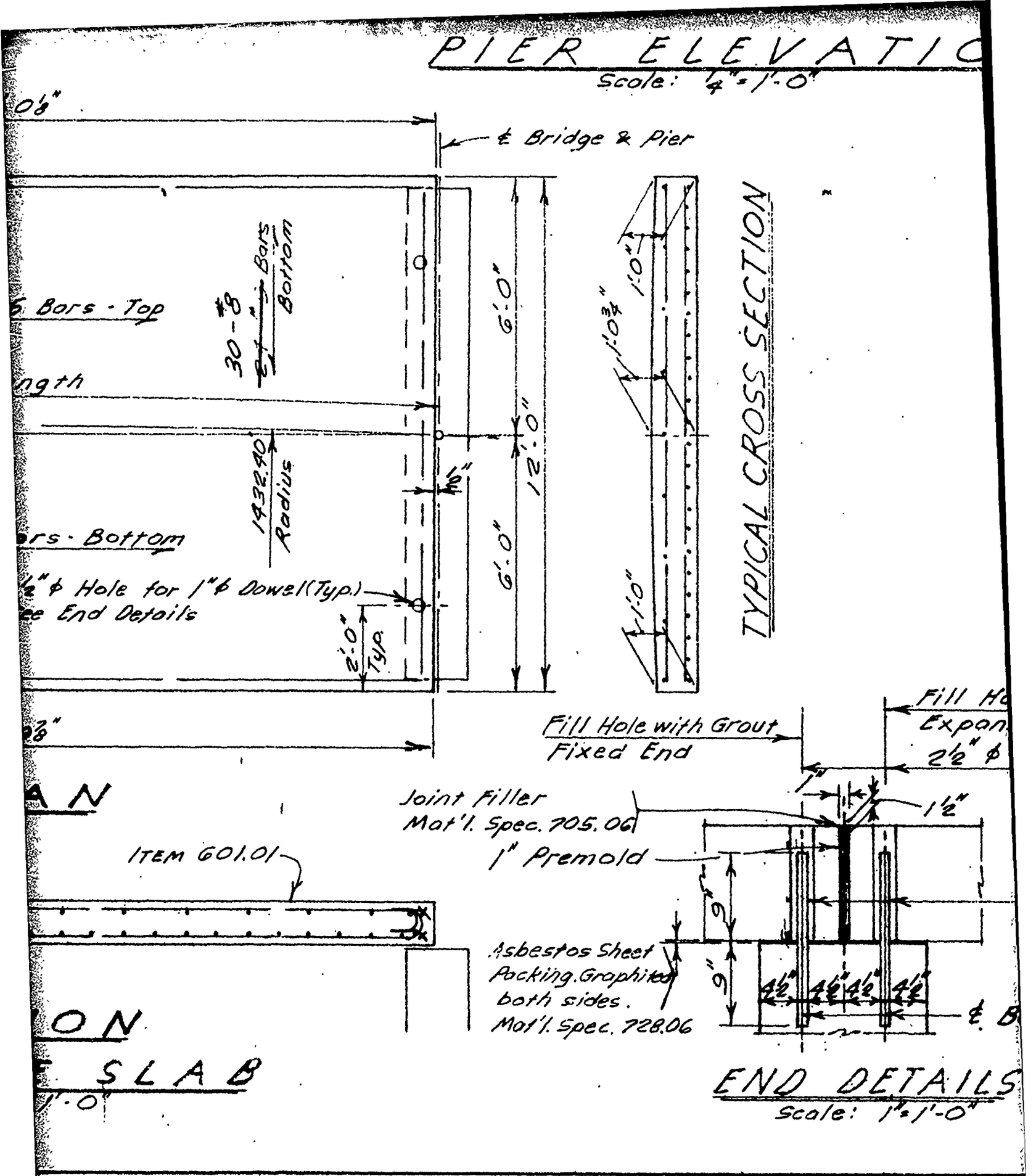
Scale: 3/8" = 1'-0"

SRI Ac/LRJ 9/13/77

N3878

6


ELEVATION
1/4" = 1'-0"
2-#5 (1 Top, 1 Bot.)
1'-0"
1'-0"
1'-0"
1'-0"
1'-0"
1'-0"
6'-0"
1 Bot.)
6'-6"
℄ Bridge & Pier
15
21'-0" Arc
1/2"
9-#5 Bars-Top
29-#6
20
PL
1'-9 1/2"
2'-0"
φ Hole
ate Stem
Floor Stand
Anchor Bolts
(Provided by
Gate Mfr.)
3'-6"
1'-1"
1'-0"
2-#5
9 1/2"
2" Cover
Typical
1'-0"
2" Cov.
SECT
BRIDG
Scale: 3
ILS


PIER ELEVATIO
Scale: 1/4" = 1'-0"
0 1/8"
℄ Bridge & Pier
5 Bars - Top
30 - #8
Bars
Bottom
ngth
6'-0"
12'-0"
1'-0"
1'-0 3/4"
1'-0"
TYPICAL CROSS SECTION
1432.40
Radius
1/8"
rs - Bottom
1/2" ϕ Hole for 1" ϕ Dowel (Typ.)
ee End Details
2'-0"
Typ.
6'-0"
9 7/8"
Fill Hole with Grout
Fixed End
Fill Ho
Expan
2 1/2" ϕ
AN
Joint Filler
Mat'l. Spec. 705.06
1" Premold
1"
1 1/2"
ITEM 601.01
9"
9"
Asbestos Sheet
Packing. Graphited
both sides.
Mat'l. Spec. 728.06
4 1/2"
4 1/2"
4 1/2"
4 1/2"
℄ B
ON
E SLAB
1'-0"
END DETAILS
Scale: 1" = 1'-0"

AT WEIR

NOTE:

Bridge slabs over Weirs and Gates may be pre-cast or cast-in-place at Contractor's option. Bridge slabs over earth fill, and slab to operating stand shall be cast in place.

Gate erection equipment will be permitted on dam bridge if gross weight does not exceed 36 tons or single axle load 16 tons. When erecting gates, place loaded wheels over a pier. For gate details and erecting procedure see manufacturer's literature. See Specifications.

with Bitumen
on End
oles

x 1'-6"
owels

ring

AS BUILT

REV.	DATE	DESCRIPTION	BY	CK.

CITY OF AUBURN, N.Y.

RENOVATION OF MILL STREET DAM

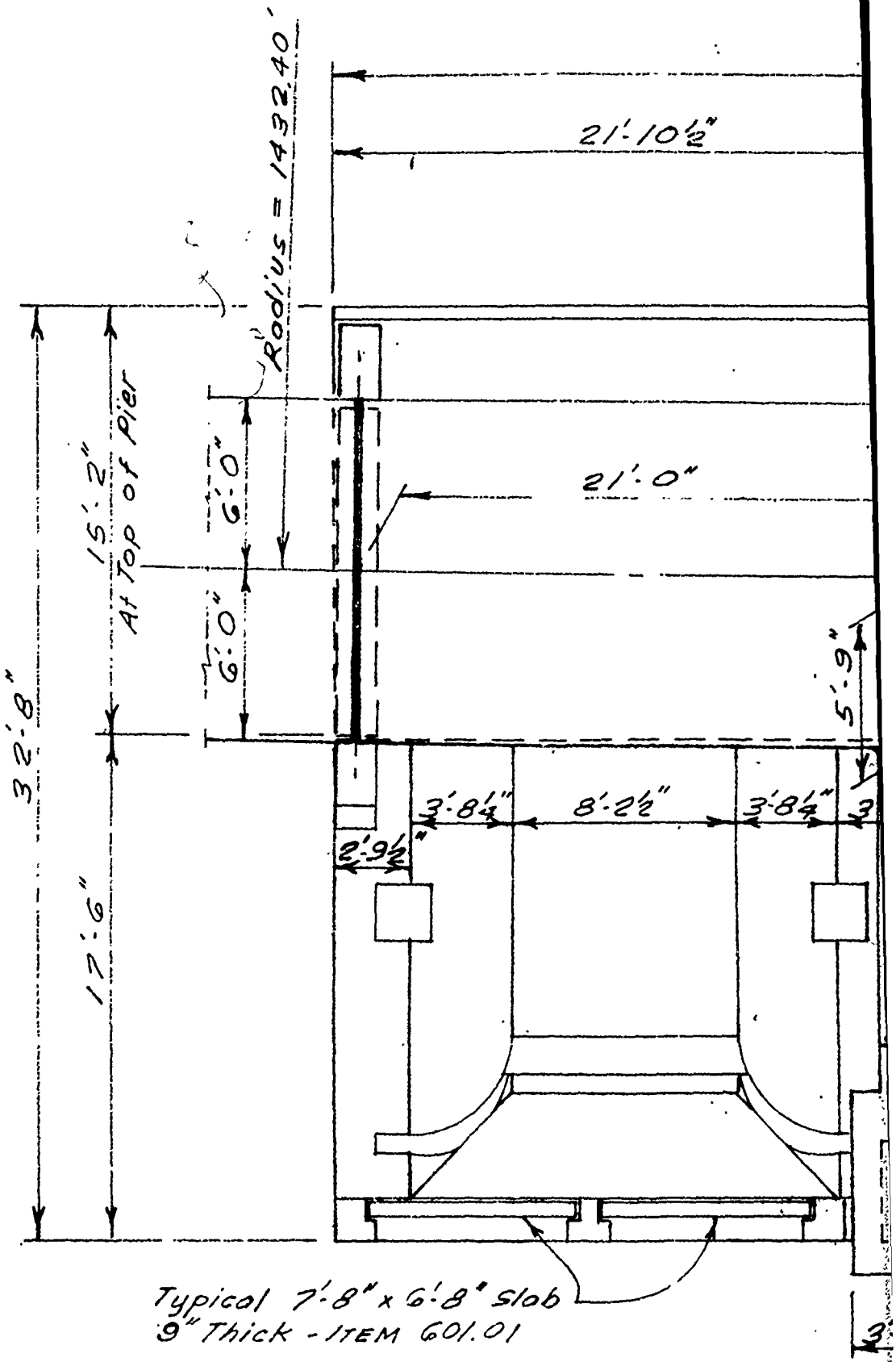
CONTRACT NO. 2

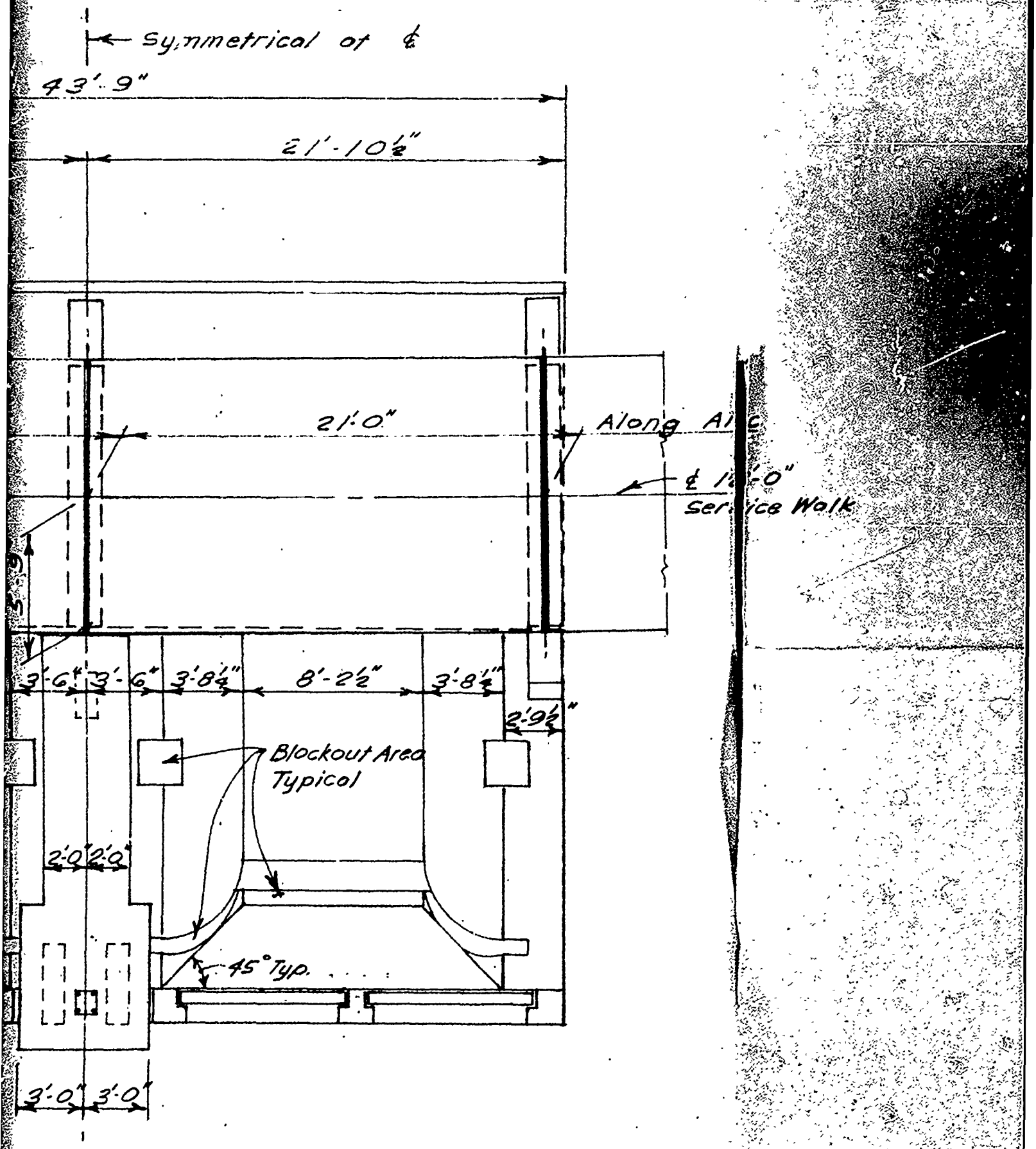
GATE STRUCTURE DETAILS-I

KONSKI ENGINEERS, P.C.

SYRACUSE NEW YORK

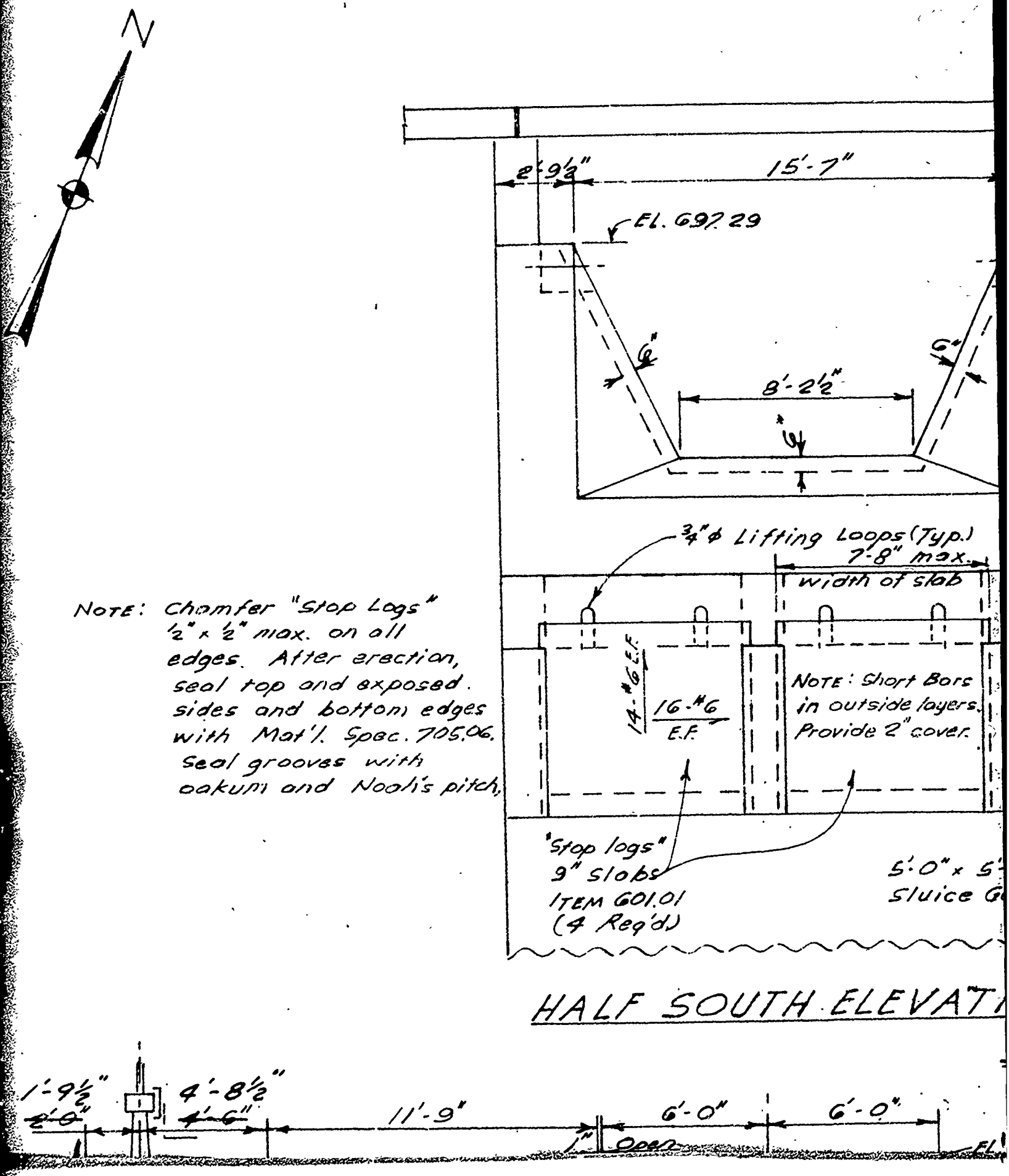
MADE BY	CHECKED BY	SCALE	DATE	DRAWING NO.	SHEET
Ac	JWG	As Noted	8-16-76	7240F2-G1	6


Radius = 1432.40'
21'-10½"
21'-0"
15'-2"
At Top of Pier
6'-0"
6'-0"
32'-8"
17'-6"
5'-9"
3'-8¼"
8'-2½"
3'-8¼"
3
2'-9½"
Typical 7'-8" x 6'-8" Slab
9" Thick - ITEM 601.01
3

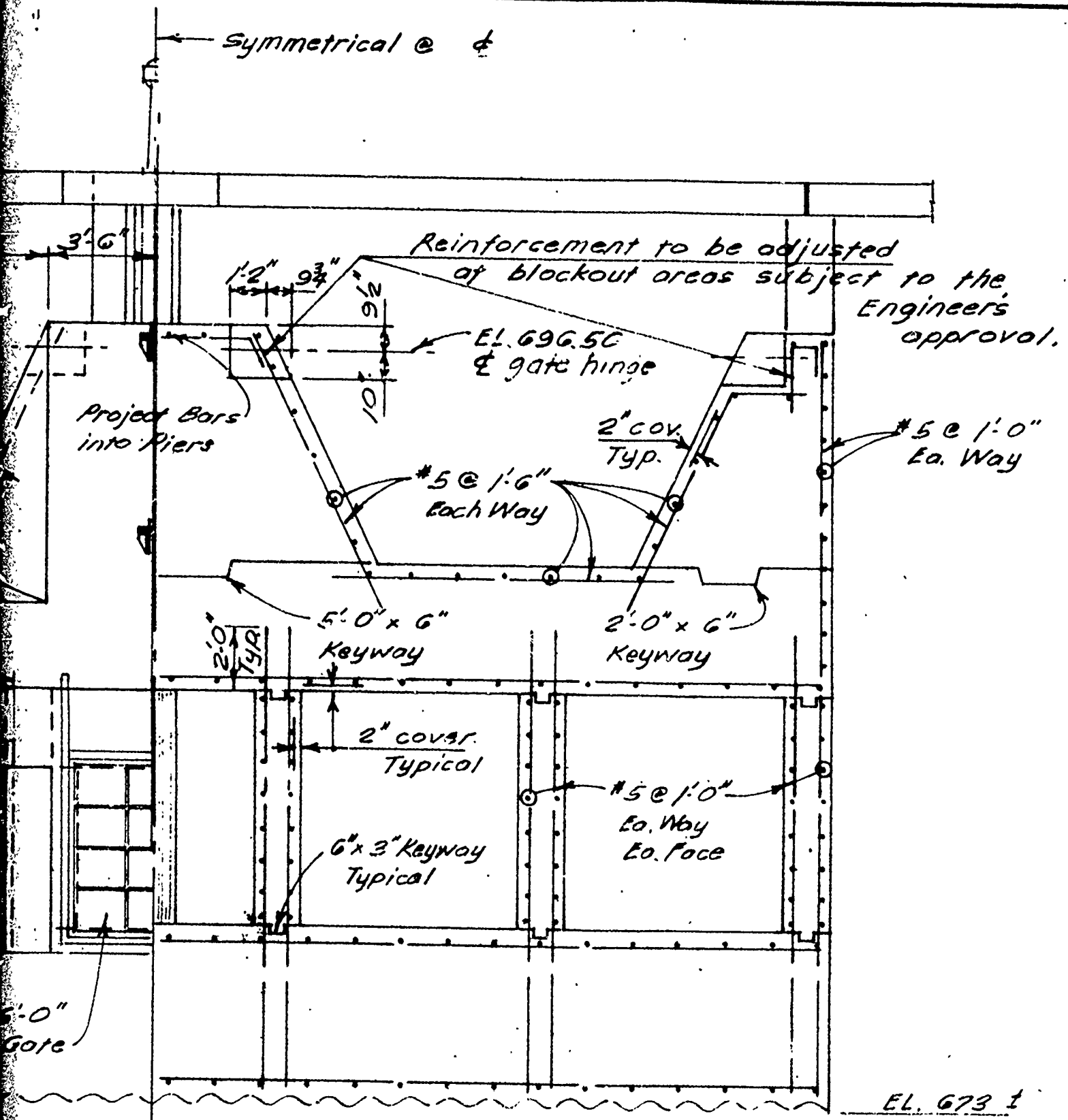


NOTE: Blockout areas are provided in first stage concrete for grouting

A N



Note: Chamfer "Stop Logs" ½" x ½" max. on all edges. After erection, seal top and exposed sides and bottom edges with Mat'l. Spec. 705.06. Seal grooves with oakum and Noah's pitch.



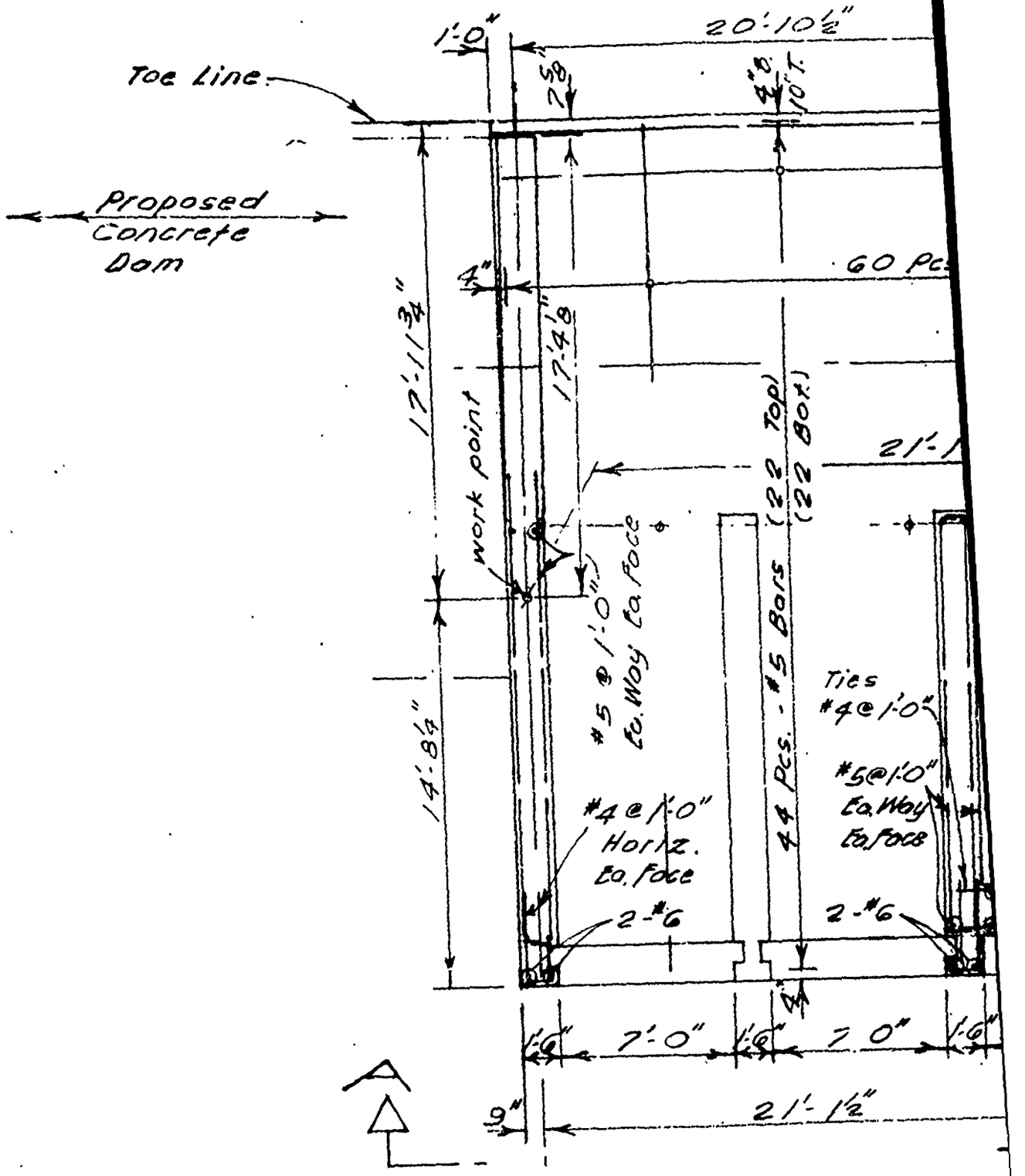
ION HALF SECTION

SECTION A-A

Scale: ¼"=1'-0"

202.00

9



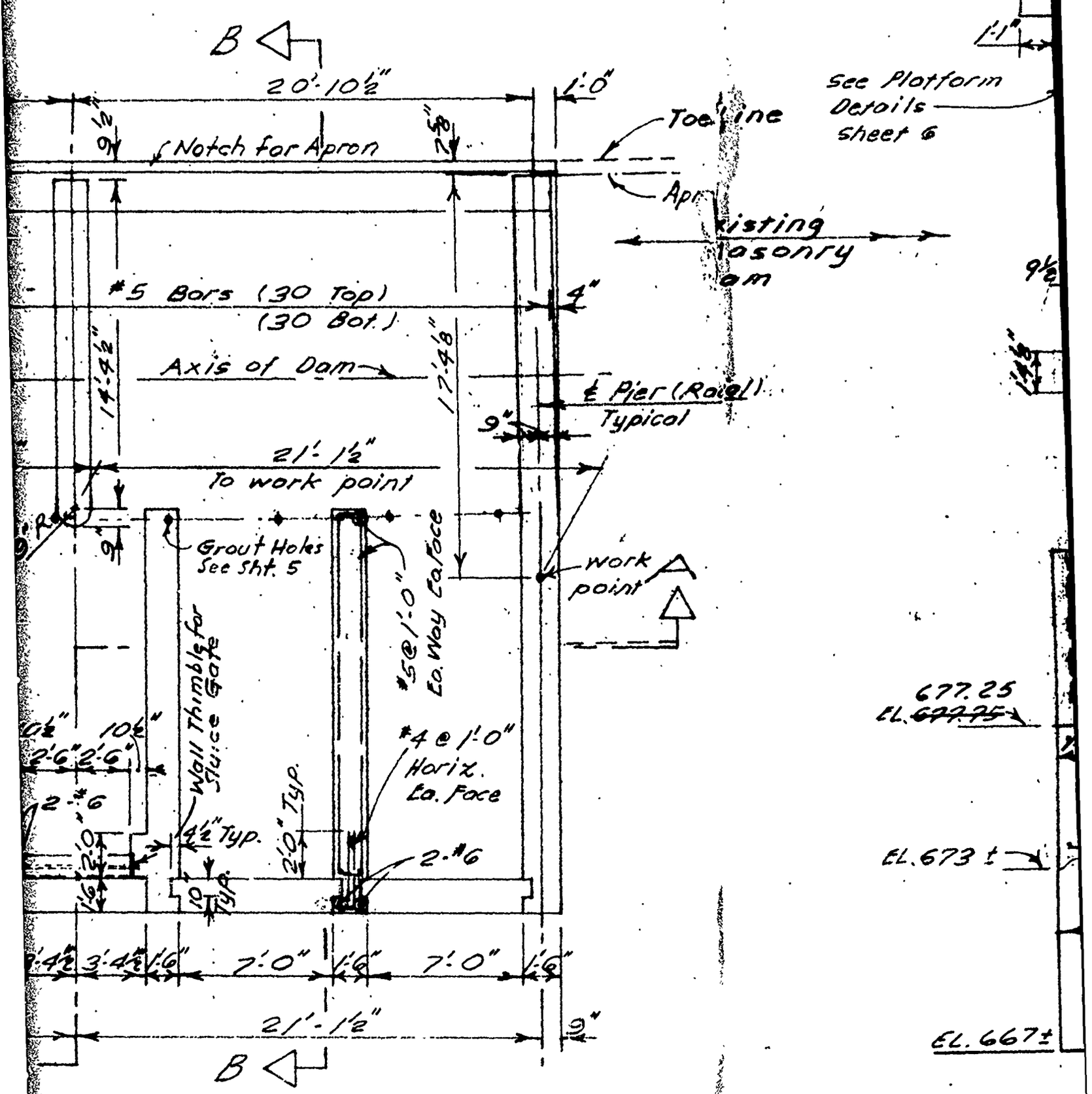
FOUNDATI

Scale

SR1 A/E/DAI 9/20/77 SR2 DAI 9/20/77

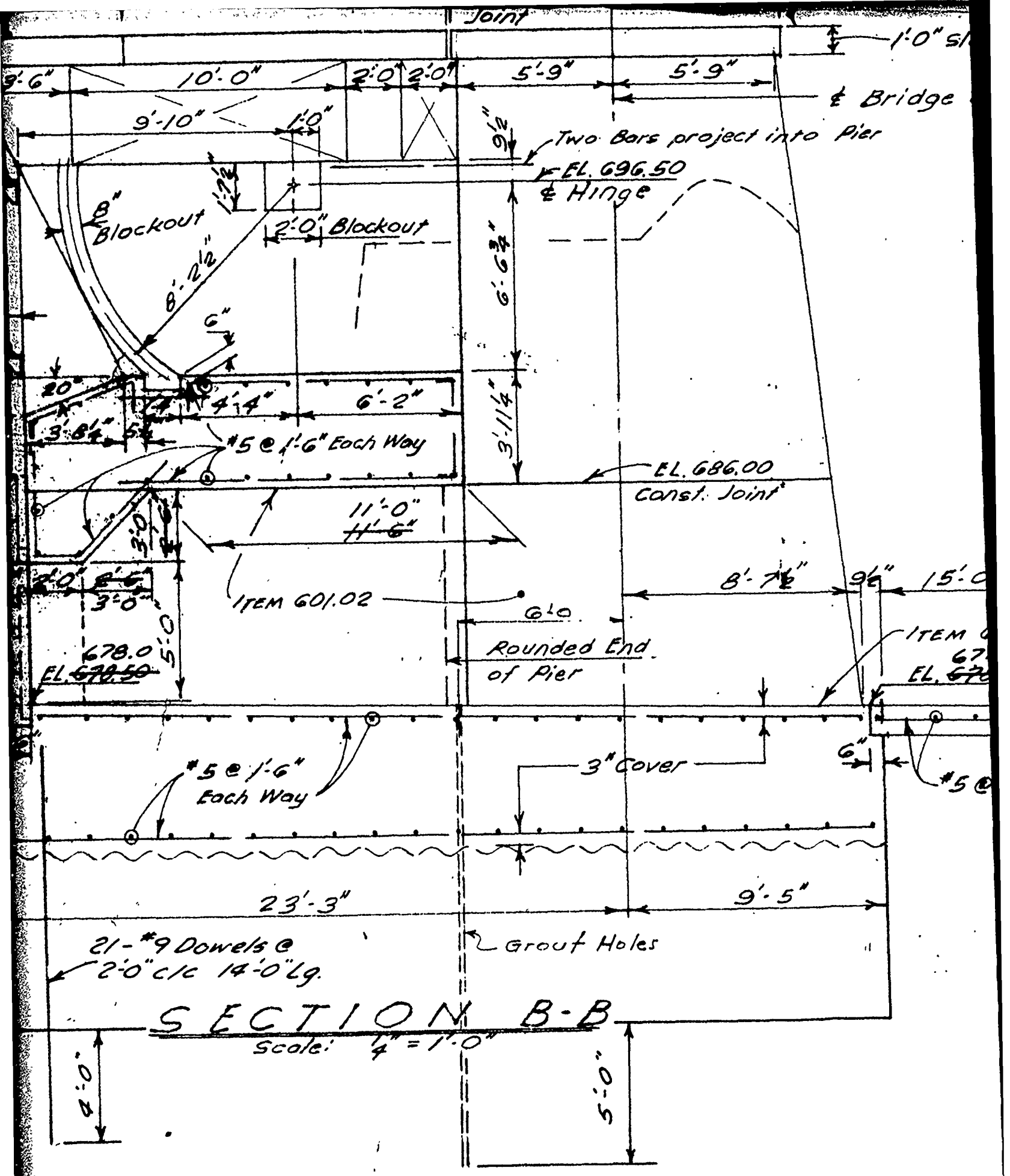
N3878

smoothed out flush with wall surface.



ON PLAN

3/16" = 1'-0"


Joint
1'-0" sl
9'-6"
10'-0"
2'-0"
2'-0"
5'-9"
5'-9"
℄ Bridge
9'-10"
1'-0"
9½"
Two Bars project into Pier
EL. 696.50
℄ Hinge
1'-2½"
8" Blockout
2'-0" Blockout
8'-2½"
6'-6¾"
6"
20"
4'-4"
6'-2"
3'-8¼"
#5 @ 1'-6" Each Way
3'-11¼"
EL. 686.00
Const. Joint
11'-0"
~~11'-6"~~
3'-0"
2'-0"
3'-0"
ITEM 601.02
8'-7½"
9½"
15'-0
6'-0
Rounded End of Pier
678.0
EL. ~~678.50~~
5'-0"
ITEM
EL.
#5 @ 1'-6" Each Way
3" Cover
6"
#5 @
23'-3"
9'-5"
21-#9 Dowels @ 2'-0" c/c 14'-0" Lg.
Grout Holes
SECTION B-B
Scale: ¼" = 1'-0"
4'-0"
5'-0"

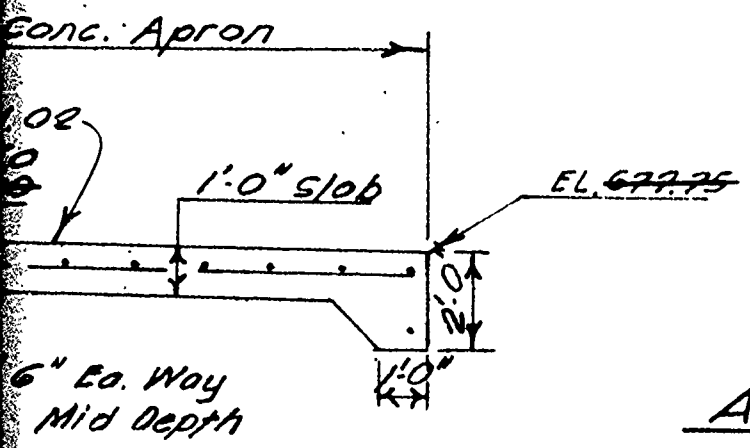
8

NOTES:

The bottom of footing is on approximate bedrock. Where sound rock is 2' or less below the given elevation, backfill with Class B concrete. Where sound rock is more than 2' below the given elevation, the Design Engineer shall be so notified and an evaluation of the condition made.

For design purposes, the foundation pressure does not exceed 2.5 tons per square foot.

Place #5 bars @ 1'-0" centers each way in all exposed faces of gate structure where not otherwise specified.



AS BUILT

REV.	DATE	DESCRIPTION	BY	CK.

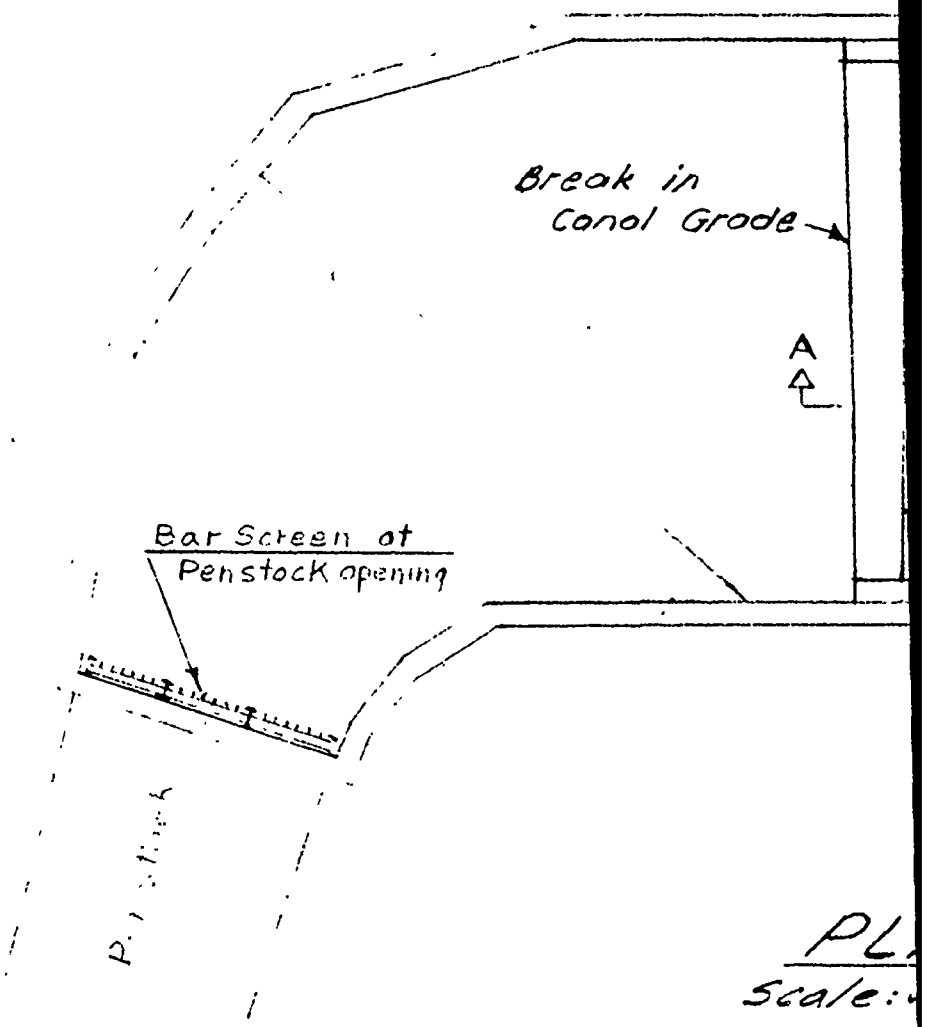
CITY OF AUBURN, N.Y.
RENOVATION OF MILL STREET DAM
CONTRACT NO. 2

GATE STRUCTURE DETAILS-II

KONSKI ENGINEERS, P.C.

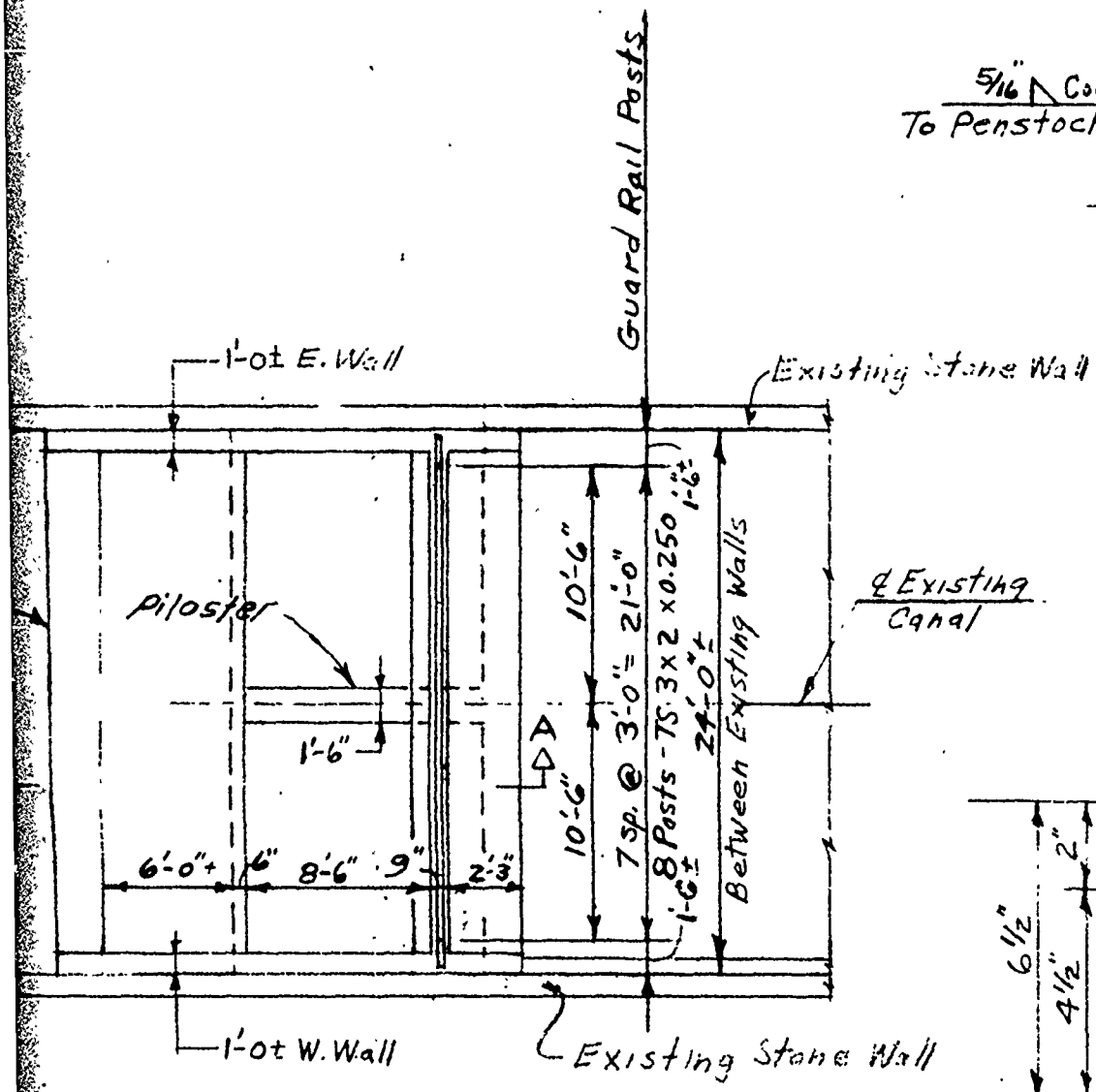
SYRACUSE NEW YORK

MADE BY	CHECKED BY	SCALE	DATE	DRAWING NO.	SHEET
Ac	JWG	As Noted	8-16-76	7240F2-G2	7

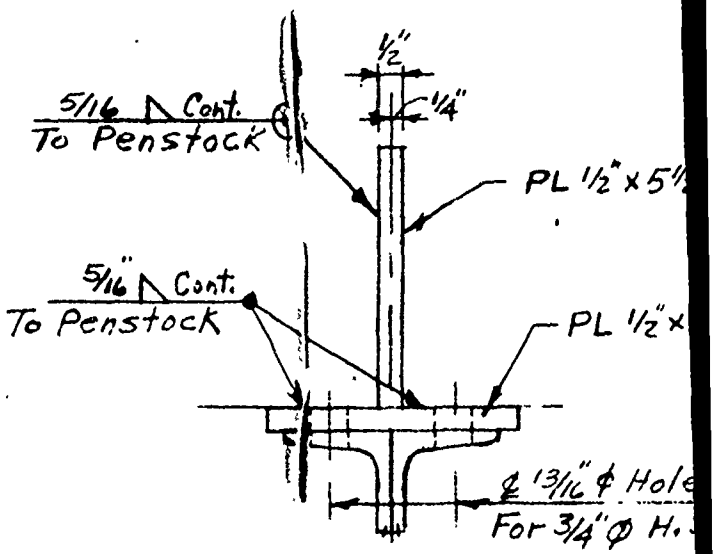


PL

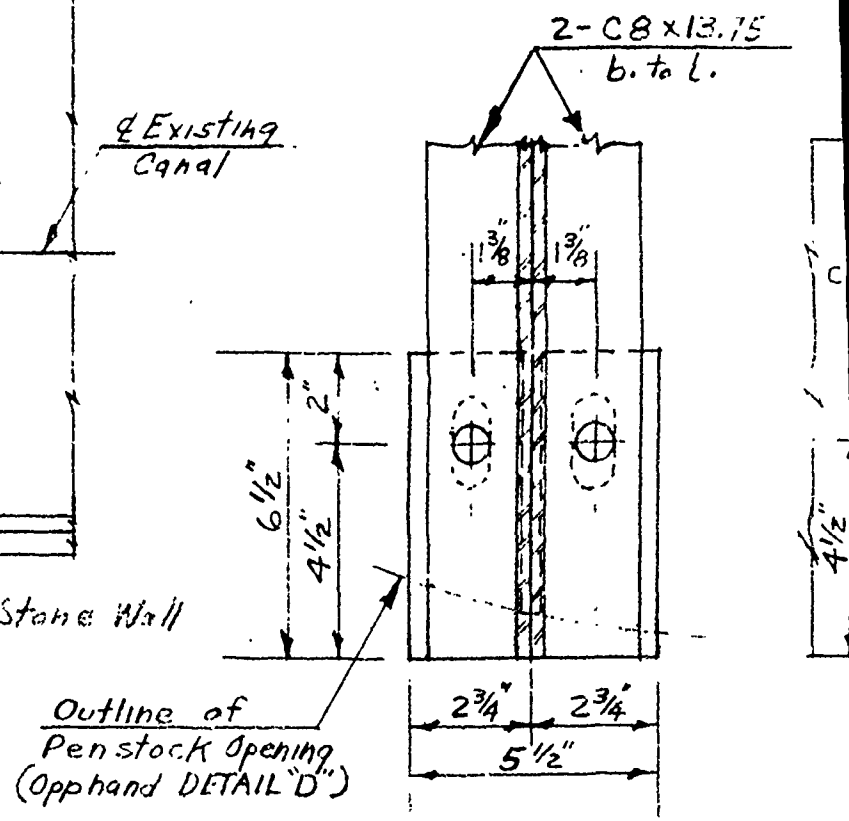
Scale:



PLAN
Scale: 1/8" = 1'-0"



PLAN

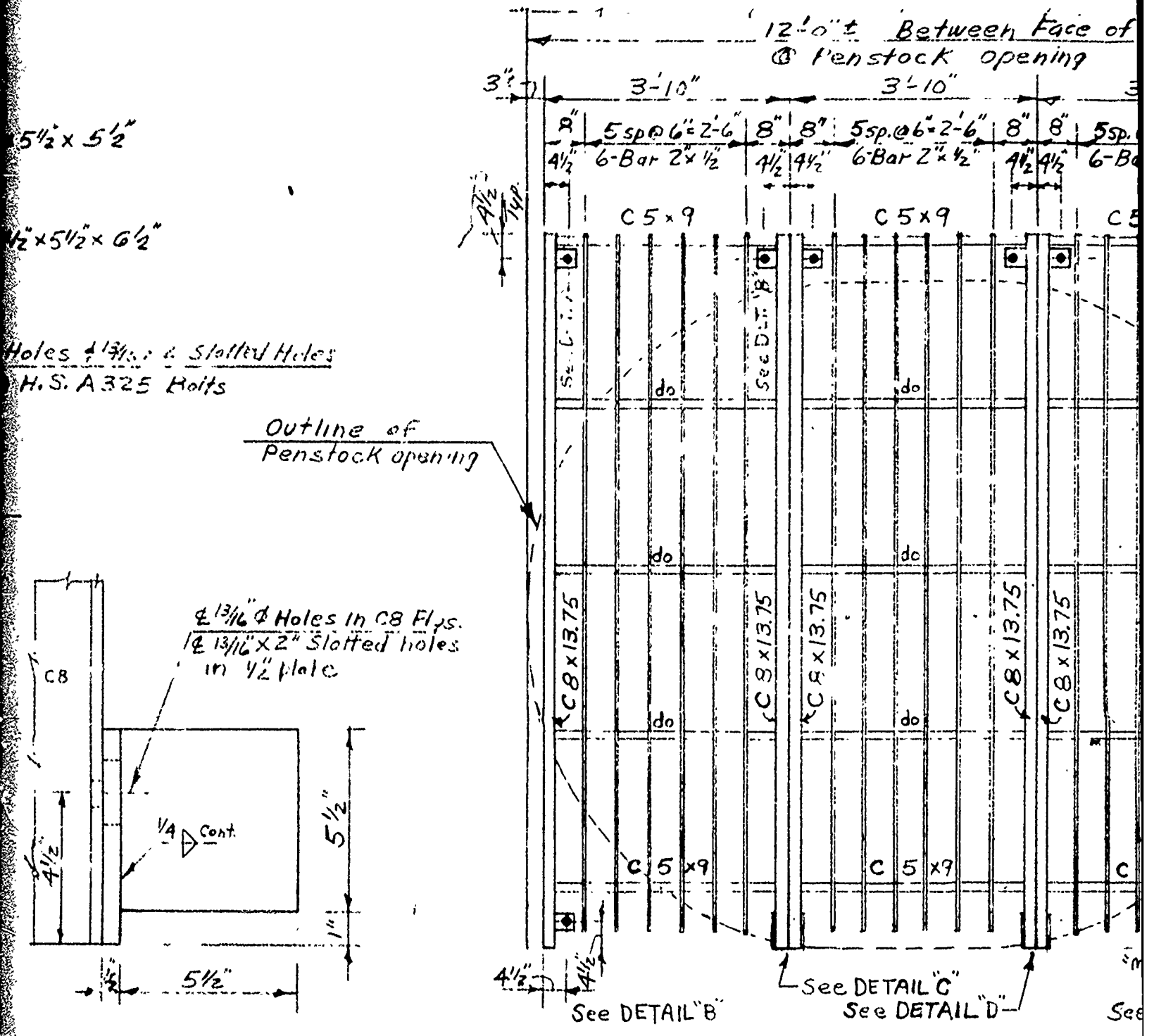


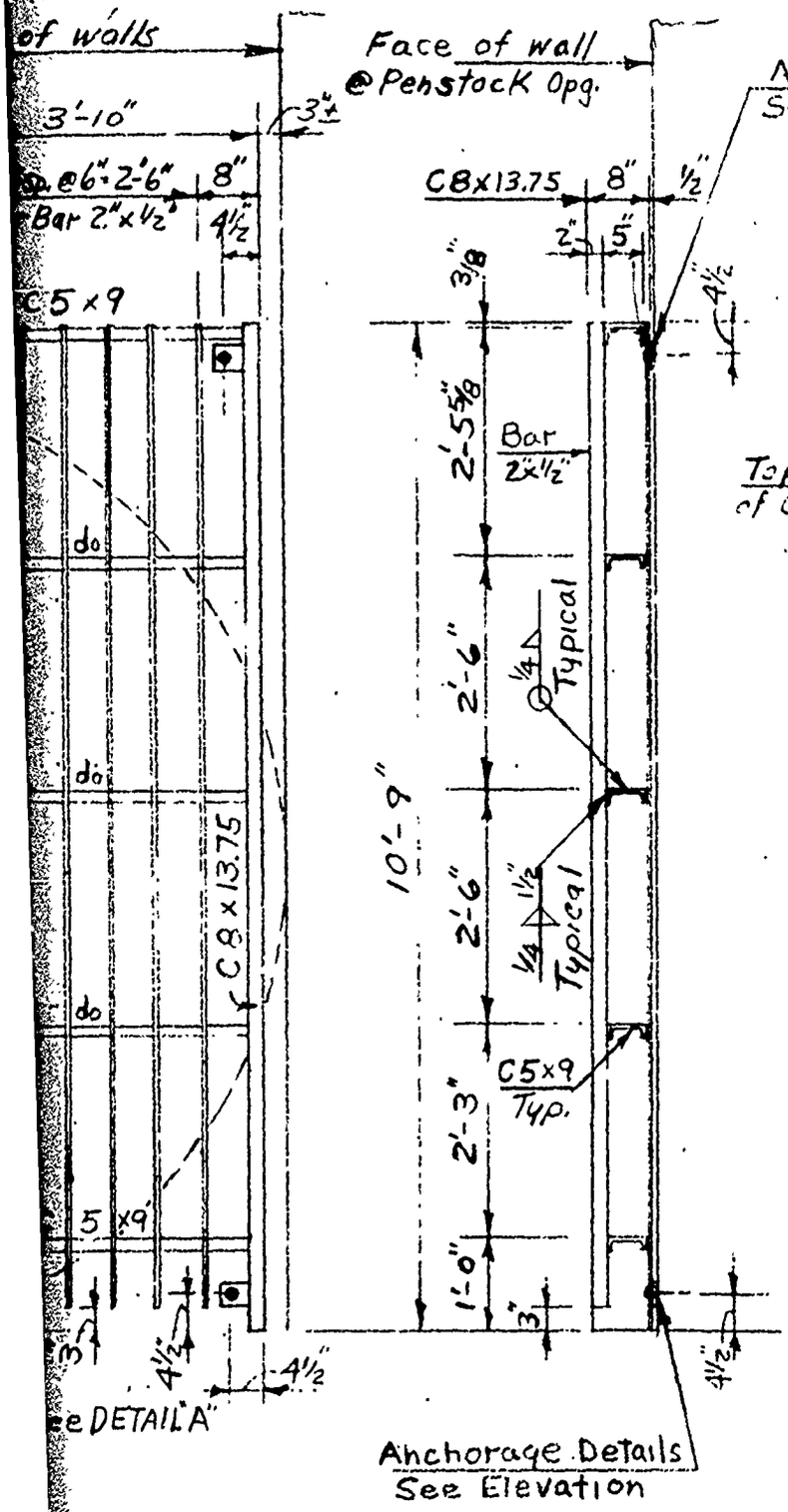
FRONT VIEW

DETAIL "C"

DETAIL "D" (O

Scale: 3" = 1'-0" (Pe


12'-0" ± Between Face of
@ Penstock opening
3'-10"
3'-10"
5 sp @ 6" = 2'-6"
6-Bar 2" x 1/2"
C 5 x 9
C 8 x 13.75
do
See DETAIL "B"
See DETAIL "C"
See DETAIL "D"
5 1/2" x 5 1/2"
1/2" x 5 1/2" x 6 1/2"
Holes & 13/16" & Slotted Holes
H.S. A325 Bolts
Outline of
Penstock opening
13/16" Φ Holes in C8 Flgs.
13/16" x 2" Slotted holes
in 1/2" plate
C8
1/4 Cont.
4 1/2"
5 1/2"
1"
1/2"
5 1/2"
SIDE VIEW
ELEVATION
BAR SCREEN A
Sca
Item C
(Opp. Hand)
(Penstock Opg.)

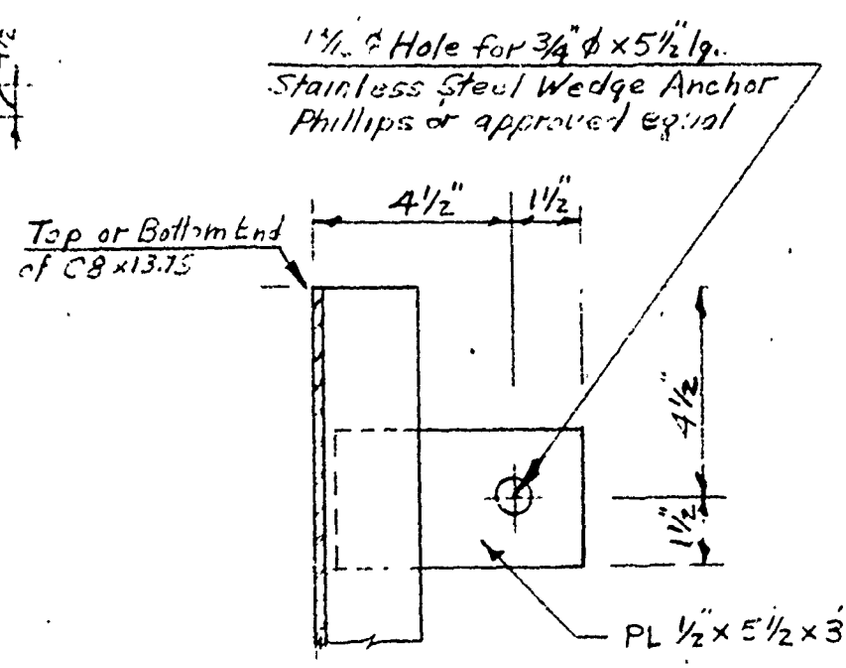


TYPICAL SECTION

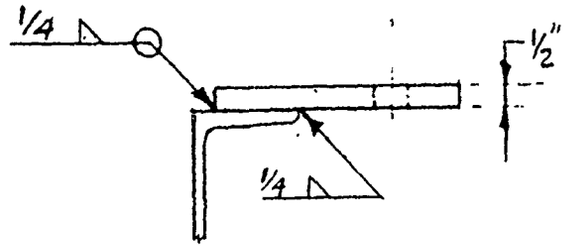
AT PENSTOCK OPENING

Scale: 1/2" = 1'-0"

616.01



ELEVATION

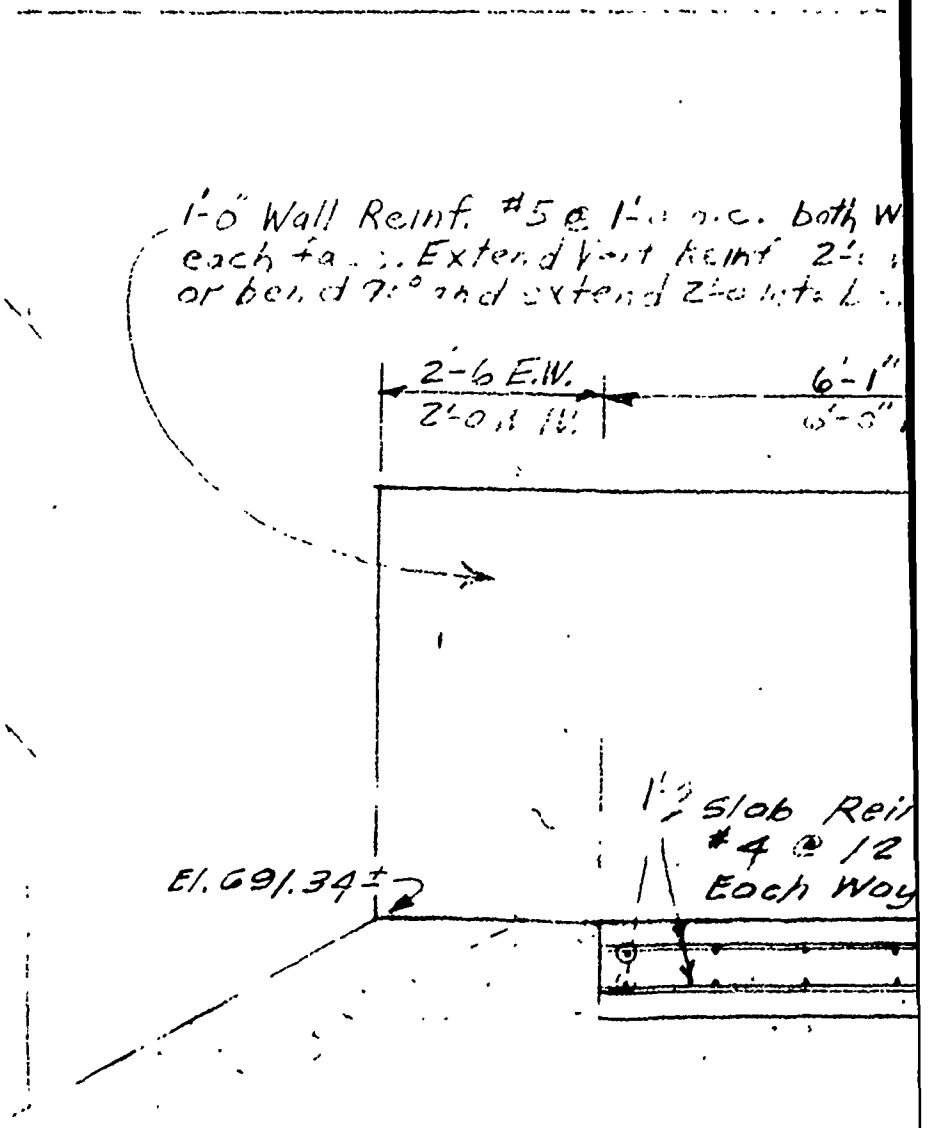


PLAN

DETAIL "A"

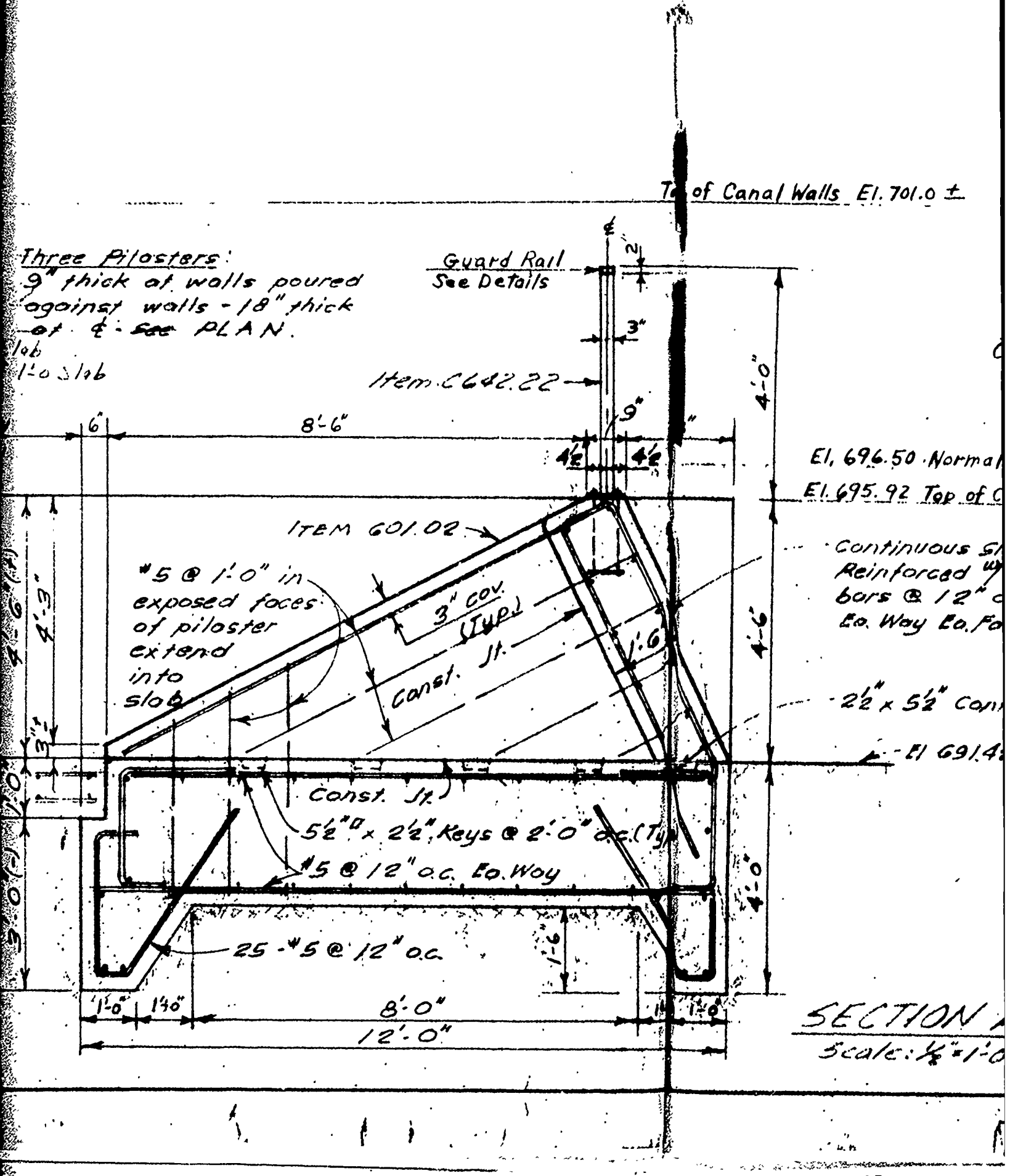
DETAIL "B" (Opp. Hand)

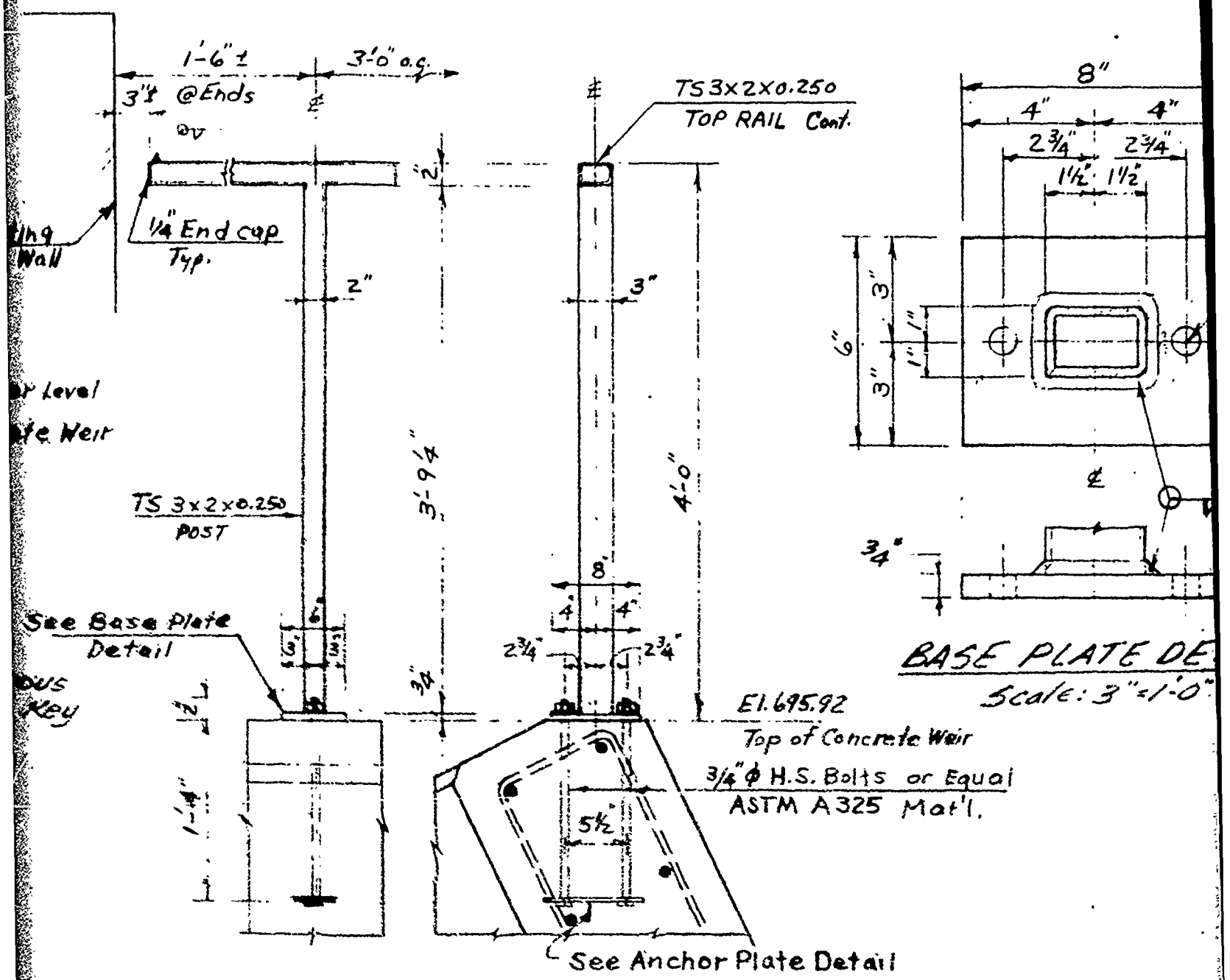
Scale: 3" = 1'-0"



SR2 AW 9/21/77
SR1 ACKEAS 9/13/77

N3878


Top of Canal Walls El. 701.0 ±
Three Pilasters:
9" thick at walls poured against walls - 18" thick at ℄ - See PLAN.
Guard Rail
See Details
3"
Item C682.22
9"
4'-0"
6"
8'-6"
4½"
4½"
El. 696.50 Normal
El. 695.92 Top of C
ITEM 601.02
#5 @ 1'-0" in exposed faces of pilaster extend into slab
3" cov. (Typ.)
Const. Jt.
1'-6
4'-6"
4'-3"
3"
Continuous Sl
Reinforced w
bars @ 12" c
Ea. Way Ea. Fa
2½" x 5½" Con
El 691.4
Const. Jt.
5½" x 2½" Keys @ 2'-0" o.c. (Typ.)
#5 @ 12" o.c. Ea. Way
25 - #5 @ 12" o.c.
1'-6
4'-0"
1'-0"
1'-0"
8'-0"
12'-0"
SECTION
Scale: ½" = 1'-0

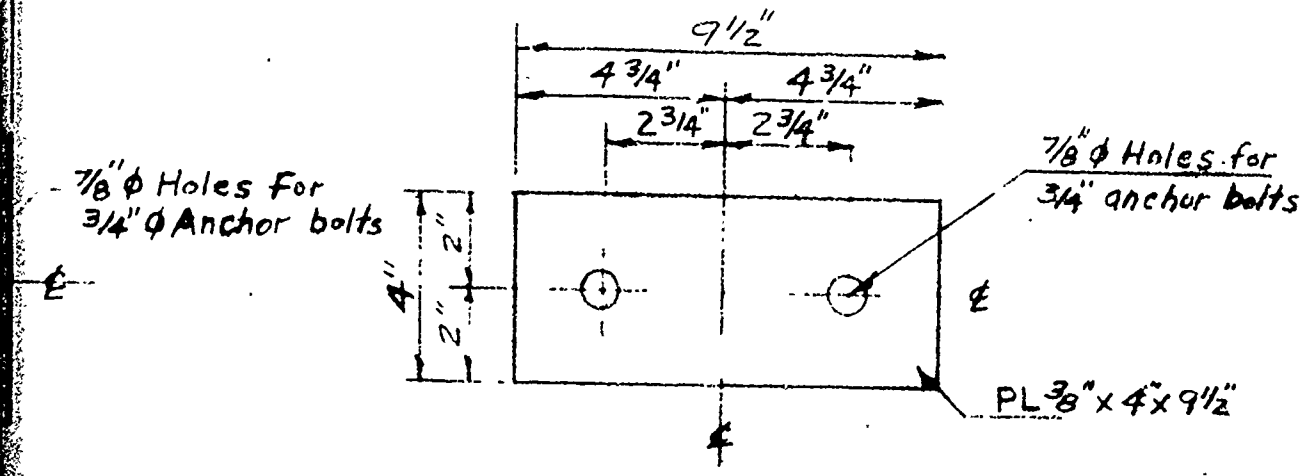


FRONT VIEW SIDE VIEW

GUARD RAIL DETAILS

Scale: 1" = 1'-0"

All Structural Steel and Plate Material to be ASTM A-36.
For Railing Material see Sheet 9



ANCHOR PLATE DETAIL
Scale: 3" = 1'-0"

3/8" Full Throat
PL 3/8" x 8" x 6

AIL

AS BUILT

REV.	DATE	DESCRIPTION	BY	CK.

CITY OF AUBURN, N.Y.
RENOVATION OF MILL STREET DAM
CONTRACT NO. 2

CANAL WEIR AND BAR SCREEN

KONSKI ENGINEERS, P.C.
SYRACUSE NEW YORK

MADE BY	CHECKED BY	SCALE	DATE	DRAWING NO.	SHEET
DAD	[illegible]	As Noted	8-16-76	7240F2-D1	8

9

ESTIMATE OF QUA

ITEM	DESCRIPTION
201.0601	Clearing and Grubbing
203.02	Unclassified Excavation and Dispo
203.03	Embankment in Place
203.09	Proof Rolling
203.21	Select Structure Fill
206.01	Structure Excavation
304.01	Subbase Course
403.01	Asphalt Concrete - Type 1A Top
403.05	Asphalt Concrete - Type 1A Binder
403.07	Asphalt Concrete - Type 1A Base
601.01	Class A Concrete for Structures
601.02	Class B Concrete for Structures
601.0301	Class A Concrete for Structures (Monolithic Slab - Bottom Formwork A
602.02	Bar Reinforcement for Structures
604.07	Altering Catch Basins, Manholes, Fi Inlets and Drop Inlets
606.10	Box Beam Guide Railing
606.11	Box Beam Guide Railing (Shop
606.14	Box Beam Guide Railing End A
C607.0214	Galvanized Steel Chain Link Fe with Top Rail (4' High)
C607.0216	Galvanized Steel Chain Link Fenc with Top Rail (6' High)
C607.13	Galvanized Steel Fence Gates
608.02	Asphalt Concrete Sidewalks, Driveway and Class 1 Bikeways
609.02	Stone Curb - Granite (Type C)
609.03	Stone Curb - Bridge (Type F1)
	Special Areas

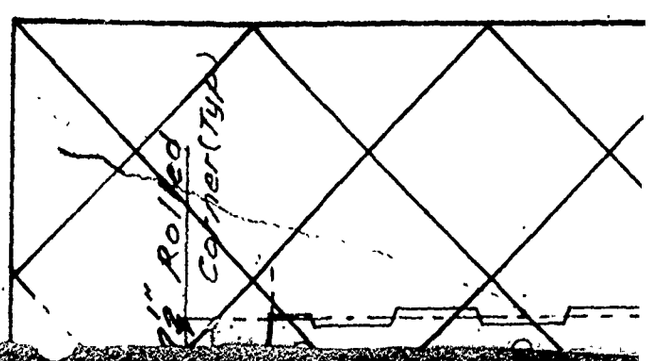
UA UANTITIES

	BASIC CONTRACT
	L. S.
ispo Disposal	3,650 C.Y.
	5,600 C.Y.
	2,000 S.Y.
	550 C.Y.
	1,450 C.Y.
	425 C.Y.
o op	110 Ton
nder inder	165 Ton
se ase	325 Ton
ure tures	150 C.Y.
es ures	1,950 C.Y.
res ures	
rk A ork Required)	854 S.F.
res tures	118,700 Lb.
Fi es, Field	
	1 Ea.
	57 L.F.
urved)	34 L.F.
sembly	4 Ea.
Fencing	
	654 L.F.
enci Fencing	
	250 L.F.
es	3 Ea.
way iveways	
	80 Ton
	755 L.F.
)	54 L.F.
	0.2 Ac.

COMPUTED FLOW CA

Pool	A. Gates	Spillway		Canal
Elev'n.	Flow	Depth	Flow	Depth
696.5*	0/940	0.	0	0.6
697.0	980	0.4	120	1.1
698.0	1060	1.4	770	2.1
699.0	1130	2.4	1720	3.1
700.0	1210	3.4	2890	4.1

*Normal Pool Elevation

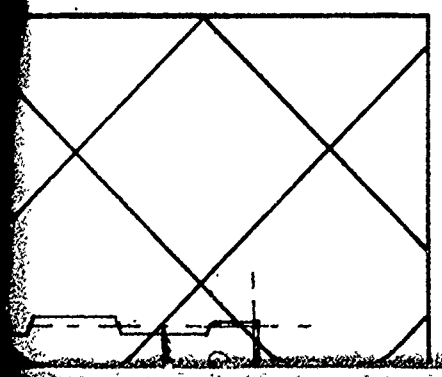


2

LOW CAPACITIES OF RENOVATED DAM

Canal Weir		Outlet Gate		Total Flow		Free-board
Depth	Flow	Depth	Flow	w/o O.G.	w O.G.	
0.6	30	18.0	540	970	1510	5.5
1.1	80	18.5	550	1180	1730	5.0
2.1	220	19.5	570	2050	2620	4.0
3.1	390	20.5	590	3240	3830	3.0
4.1	670	21.5	610	4770	5380	2.0

O.G. = Outlet Gate



GENERAL NOTES

Design Specifications: Current American A
Transportation Officials Standard Specifica

Live Load on Dam Bridge: HS20-44 Truck
foot.

Material and Construction Specifications:
State Department of Transportation dated J
addenda except as modified by the Special
proposal.

Concrete Items: Description
Mass Concrete in Dam
Piers or Columns over 12" thick
Piers or Columns 12" thick or less
Bridge Deck Slabs (Dam)
Bridge Deck Slab (Roadway Bridge)
Sidewalks (Roadway Bridge)
Bridge Abutments (Roadway Bridge)
Canal Weir
Cap on Sewer Bridge Pier (if needed)

The cost of all joint material will be inclu
various items of the contract, except as o

The cost of furnishing and placing water u
Item 203.03, and Select Structure Fill, Ite
in the price bid for the item.

Clearing and Grubbing: Clear and grub o
downstream of dam that will be excavated
new embankment material. On downstream
underbrush, and trees up to 6 inches in di
trees over 6 inches in diameter that will b
construction. Variations in final slope su
permitted to accommodate large trees that

Elevation Datum: Mean sea level datum o

Utilities: Location of sewer line shown o
from positions of manholes indicated. Th
hydrant (broken underground) not shown on
believed to be underground in the area of
canal. The exact location must be determi
contractor shall be responsible for the pro
or any power or telephone lines in the area
bridge. Where necessary the contractor s
or other approved materials, and shall sec
utilities.

Subsurface Investigation: The subsurface
plans is based upon a limited investigatio
the sole purpose of preparing an estimate
considered as representative of the actual
encountered during the construction of thi
is bound into the Specifications.

FOUNDATION NOTES

n Association of Highway and
fications for Highway Bridges.

ck Load or 100 pounds per square

s; Specifications of New York
d January 2, 1973, with current
cial Specifications in the

Item No.
601.02
601.02
601.01
601.01
601.0301
601.01
601.02
601.02
601.01

cluded in the price bid for the
s otherwise specified.

r used for Embankment in Place,
Item 203.21, shall be included

only those areas upstream and
d to trim slopes or covered by
am slopes remove all
diameter. Remove only those
be affected by new slope
surface of 1'-0± will be
at can be left in place.

of 1929.

on the plans was determined
There is also a waterline and
on the plans. The waterline is
f Miller Street just west of the
rmined in the field. The
otection of the above utilities
rea of the proposed canal
shall provide timber, plank,
securely brace and protect these

e information shown on these
tion made by the Engineer for
of quantities and is not to be
al conditions which may be
is project. Test hole data

FOUNDATION NOTES (Cont'd)

All disintegrated or shattered material shall be removed to the lines and levels ordered by the Engineer. Where unsuitable rock is found and additional rock removal is required the procedure to be used is indicated in other notes on these plans. Payment for additional concrete and bar reinforcement if used will be made at the unit price bid for these items. Rock removed below the levels or outside of th neat lines ordered by the Engineer shall be replaced by Item 601.02 for which no payment will be made.

Foundation Pressures: For design purposes the foundation pressure for the dam does not exceed $2\frac{1}{2}$ tons per square foot. That for the ca bridge and weir does not exceed $1\frac{1}{2}$ tons per square foot.

Sheet Piling: The contractor may use steel sheet-piling sections oth than those indicated on the plans provided the section modulus per foot of wall is not less than that for the sections shown. Safe operation sheet piling may be made of any suitable material of adequate strength.

Grouting: The rock foundation beneath the new gate structure and ne section of dam shall be pressure grouted after completion of the firs concrete lift (footing). Holes for grouting shall be drilled through th new concrete and into the rock to the minimum depth shown. Grouti pressures shall not exceed fifty pounds per square inch. If grout appears at the interface between the concrete and the rock, grouting in that area shall be stopped and the grout allowed to set. At the option of the Engineer, additional holes and grouting may be request in these areas.

Dewatering: The contractor's attention is directed to the constructi and cofferdam notes on Sheet 2, and to the possibility that continuo pumping may be necessary during early stages of construction.

DAM SUPERSTRUCTURE

Stone Masonry: The stone masonry face of the new section of the da shall match that of the existing portion as closely as possible. Sto for this purpose may be taken from excess stone stored at the site during Phase I construction and from the portions of the existing can walls that are to be removed for construction of the new canal bridge abutments. If additional stone is needed and a matching type canno be obtained, the new stones shall be placed at random among the existing stones to minimize the disparity in texture.

Weirs: Concrete weirs must be finished to the exact shape and elevation given on the plans and must be dead level.

Automatic Gates: The gate structure is designed and detailed to accommodate a certain brand of automatic gate. If a different manufacturer's product is selected and approved by the Engineer, th gate structure details will have to be altered. The details for such alterations shall be made by the Contractor and submitted to the Engineer for final approval prior to any construction. The Engineer reserves the right to modify the Contractor's details in any manner consistent with the safety of the structure and the capacity of the gates. Such alterations shall be made by the Contractor at his own expense and without additional cost to the owner.

lines
found
ed is
al
lt prices
de of the
601.02

essure
the canal

ons other
s per
e
r

and new
e first
ough the
Grouting
f grout
routing
the
equested

truction
ntinuous

the dam
. Stone
site
ng canal
bridge
cannot
the

d

to

er, the
such
e
neer
ner
the
own

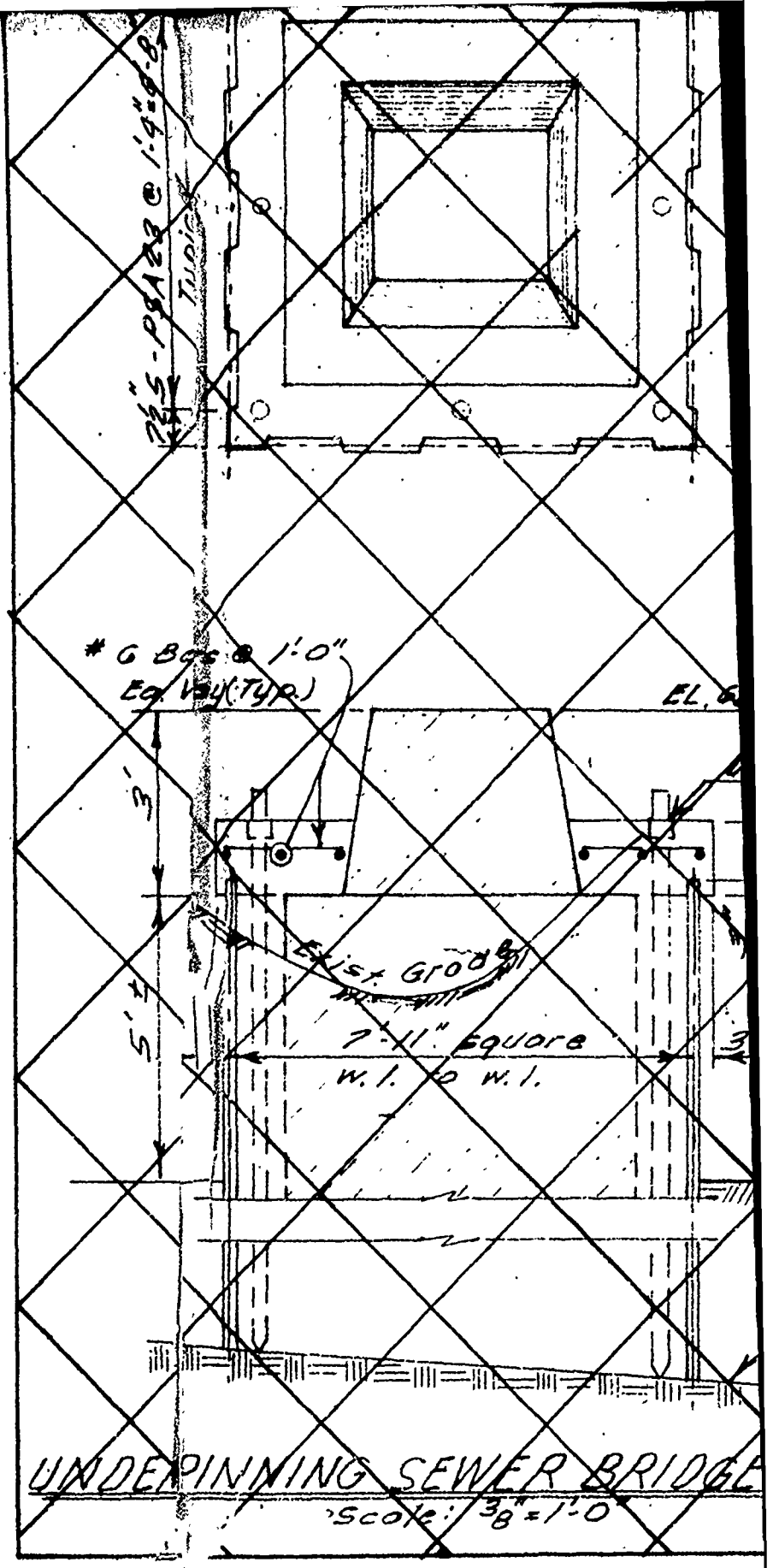
610.05	Stripping of [illegible]
613.02	Topsoil from Borrow
C616.01	Structural Steel
C617.01	Dimension Stone Masonry
620.05	Stone Filling (Heavy)
620.06	Dry Rip-Rap
620.08	Bedding Material
628.02	Permanent Steel Sheet Piling
628.0503	Safe Operation Sheet Piling
C628.061	Cofferdams
634.01	Survey and Stakeout
634.03	Concrete Cylinder Curing B
C635.01	Painting of Metal or Timber S
C637.05	Engineers Office Type A
642.11	Steel Bridge Railing (Four R
C642.21	Steel Bridge Railing (Dam Br
C642.22	Steel Railing (Canal Weir)
C642.23	Timber Guard Rail - Concrete F
C642.24	Precast Concrete Parking Bum
C642.25	Traffic Barriers
C648.2110	Drilling & Grouting Holes for
C648.2111	Drilling Holes for Foundation
C648.2112	Foundation Grouting
699.01	Mobilization
C699.10	Automatic Gates for Dam
C699.20	Outlet Gate Complete with Op

SRI Aug 9/13/77

6

N3878

	60	C.Y.
	2,300	Lb.
	630	S.F.
	150	C.Y.
	120	C.Y.
	135	C.Y.
	975	S.F.
	1,500	S.F.
	L.S.	
	L.S.	
	1	Ea.
ures	12	Gal.
	16	Mo.
	64	L.F.
	525	L.F.
	24	L.F.
	212	L.F.
	21	Ea.
	4	Ea.
ls	725	L.F.
uting	220	L.F.
	300	Bag
	L.S.	
	2	Ea.
or	1	Ea.

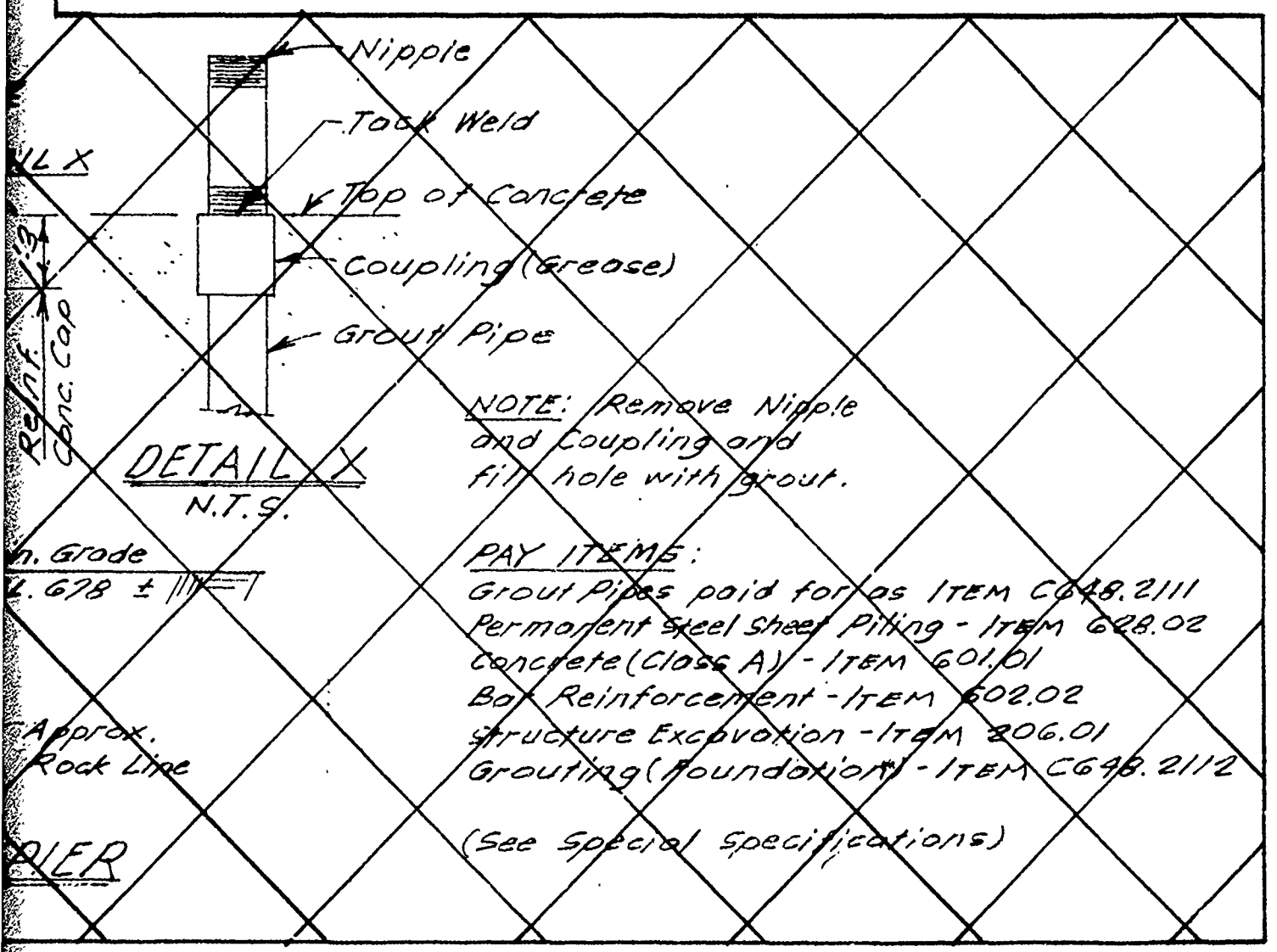


Excavation and Embankment: All sod, topsoil and unsuitable mate under the embankments shall be removed as specified under Sectio Excavation and Embankment, and replaced by the same item as the of embankment adjacent and above as shown on the plans. Existi embankments to be resloped may be benched if necessary to accom contractor's equipment. Unsuitable material may be disposed of i floor of the reservoir above the dam.

The installation of Select Structure Fill, Item 203.21, as shown o plans shall be completed to the extent possible immediately upon completion of footings, abutments or walls.

New concrete in the area of the west embankment is to be founded undisturbed material properly benched as shown on the plans.

New concrete in the back and foundations of the dam is to be foun on rock and shall be poured "in the dry". The Engineer shall insp the excavations at the time of construction to determine the suitability of the rock for supporting the structure.

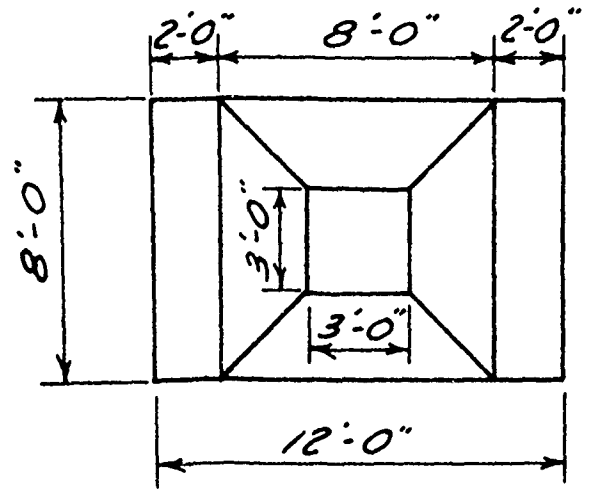


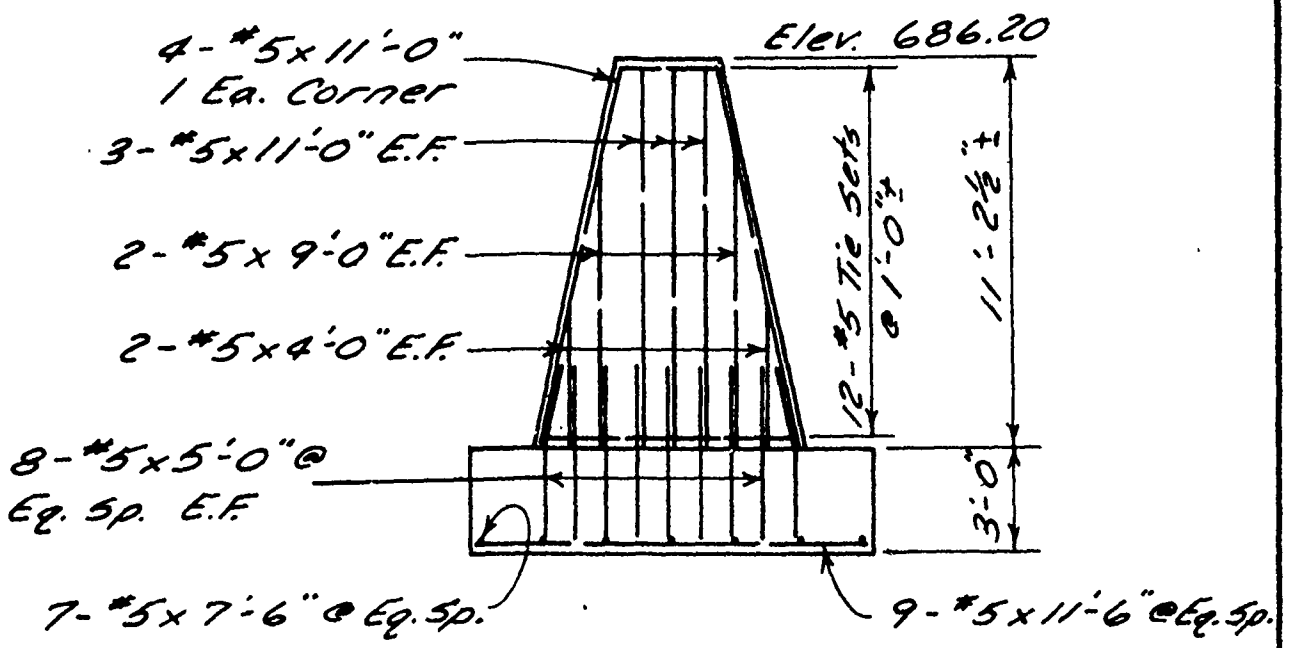
terial
tion 203,
he layer
ting
ommodate
in the

on the
n

ed on

nded
pect





SEWER BRIDGE PIER

Scale: 3/16" = 1'-0"

AS BUILT

REV.	DATE	DESCRIPTION	BY	CK.

CITY OF AUBURN, N.Y.
RENOVATION OF MILL STREET DAM
CONTRACT NO. 2

ESTIMATE OF QUANTITIES AND GENERAL NOTES

KONSKI ENGINEERS, P.C.

SYRACUSE NEW YORK

MADE BY	CHECKED BY	SCALE	DATE	DRAWING NO.	SHEET
AC	[illegible]	As Noted	8-16-76	7240F2-D7	14

9